iSWM Implementation Subcommittee Meeting

April 27, 2020

integrated Stormwater Management iSWM

North Central Texas Council of Governments
Environment & Development

Welcome and Introductions

Approval of the January 8, 2020 Meeting Summary

Work Scope: Task Order Three Updates

iSWM subcommittee meeting Halff task update presentation

SUMMARY OF TASKS

- Task 1 – Project Management and Meeting Attendance
- Task 2 – Reorganize/Re-evaluate Site Development Controls
- Task 3 – iSWM Designation Implementation Workshop
- Task 4 – Technical Meeting of iSWM Adopters
- Task 5 – iSWM Principals Regional Review
- Task 6 – Update Technical Manual rainfall intensities
- Task 7 – iSWM BMP Installation Videos

TASK 2 – REORGANIZE/RE-EVALUATE SITE DEVELOPMENT CONTROLS

- Workshops
  - October 9th, 2019
  - February 5th, 2020
- Action Items based on feedback:
  - Update five BMP summary pages
    - Bioretention
    - Dry Detention
    - Permeable Pavement
    - Sand Filter
    - Underground Detention
  - Update of primary pollutant removal capabilities table (Table 1.2)

To see the presentation

From these workshops:

http://iswm.nctcog.org/training.html

TASK 2 – REORGANIZE/RE-EVALUATE SITE DEVELOPMENT CONTROLS

- Table 1.2
  - Existing table
  - Consider if % removals need to be updated (i.e. dry detention)
  - Add disclaimer: "*% removals only valid if design specifications are met*"

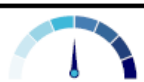
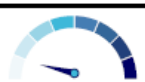
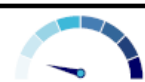
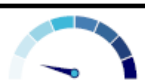
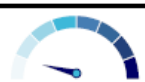
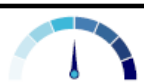
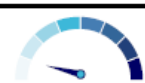
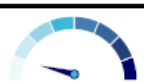
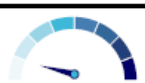
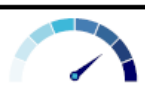
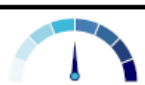
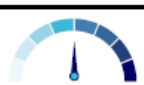
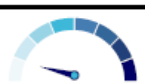
Table 1.2 Design Pollutant Removal Efficiencies for Stormwater Controls (Percentage)

Structural Control	Total Suspended Solids	Total Phosphorus	Total Nitrogen	Fecal Coliform	Metals
Bioretention Areas	80	60	50	---	80
Grass Channel	50	25	20	---	30
Enhanced Dry Swale	80	50	50	---	40
Enhanced Wet Swale	80	25	40	---	20
Alum Treatment	80	80	60	90	75
Filter Strip	50	20	20	---	40
Dry Detention	65	50	30	70	---
Organic Filter	80	60	40	50	75
Planter Boxes	80	60	40	50	60
Sand Filters	80	50	25	40	50
Underground Sand Filter	80	50	25	40	50
Gravity (Oil-Grit) Separator	40	5	5	---	---
Downspout Drywell	80	60	60	90	90
Infiltration Trench	80	60	60	90	90
Soakage Trench	80	60	60	90	90
Stormwater Ponds	80	50	30	70*	50
Green Roof	85	---	25	---	95
Modular Porous Paver Systems with infiltration	**	80	80	---	90
Porous Concrete with infiltration	**	50	65	---	60
Proprietary Systems	***	***	***	***	***
Rain Harvesting	---	---	---	---	---
Stormwater Wetlands	80	40	30	70*	50
Submerged Gravel Wetland	80	50	20	70	50

TASK 2 – REORGANIZE/RE-EVALUATE SITE DEVELOPMENT CONTROLS

- Table 1.2
  - Simplified version for reference
  - No % removals

TABLE 1.2 Design Pollutant Removal Efficiencies for Stormwater Controls

Structural Control	Total Suspended Solids	Total Phosphorus	Total Nitrogen	Fecal Coliform	Metals
Bioretention Areas					
Grass Channel					
Enhanced Dry Swale					
Enhanced Wet Swale					
Alum Treatment					
Filter Strip					
Modified Extended Detention					
Organic Filter					
	Low		Moderate		High

TASK 2 – REORGANIZE/RE-EVALUATE SITE DEVELOPMENT CONTROLS

- Summary Pages
  - Reformat to be more readable/appealing
  - Clearly communicate use, limitations, etc.
  - Use better pictures to convey how BMP can add value to a site

2.0 Bioretention

Structural Stormwater Control

Description: Shallow stormwater basin or landscaped area that utilizes engineered soils and vegetation to capture and treat runoff.

KEY CONSIDERATIONS

DESIGN CRITERIA:

- Maximum contributing drainage area of 5 acres (< 2 acres recommended)
- Often located in "landscaping islands"
- Treatment area consists of grass filter, sand bed, ponding area, organic/mulch layer, planting soil, and vegetation
- Typically requires 5 feet of head

ADVANTAGES / BENEFITS:

- Applicable to small drainage areas
- Good for highly impervious areas, flexible siting
- Good retrofit capability
- Relatively low maintenance requirements
- Can be planned as an aesthetic feature

DISADVANTAGES / LIMITATIONS:

- Requires extensive landscaping if in public area
- Not recommended for areas with steep slopes

MAINTENANCE REQUIREMENTS:

- Inspect and repair/replace treatment area components

POLLUTANT REMOVAL

80%	**Total Suspended Solids**
60/50%	**Nutrients** - Total Phosphorus / Total Nitrogen removal
M	**Metals** - Cadmium, Copper, Lead, and Zinc removal
No Data	**Pathogens** - Coliform, Streptococci, E. Coli removal

STORMWATER MANAGEMENT SUITABILITY

P	**Water Quality Protection**
S	**Streambank Protection**
S	**On-Site Flood Control**
	Downstream Flood Control

Accepts Hotspot Runoff: Yes (requires impermeable liner)

S - in certain situations

IMPLEMENTATION CONSIDERATIONS

M	**Land Requirement**
M	**Capital Cost**
L	**Maintenance Burden**

Residential Subdivision Use: Yes

High Density/Ultra-Urban: Yes

Drainage Area: 5 acres max. (< 2 acres recommended)

Soils: Planting soils must meet specified criteria; No restrictions on surrounding soils

Other Considerations: Use of native plants is recommended

L=Low M=Moderate H=High

TASK 2 – REORGANIZE/RE-EVALUATE SITE DEVELOPMENT CONTROLS

- Draft Summary Pages

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Stormwater Management

Bioretention

Description

Bioretention facilities, sometimes called rain gardens or bioretention filters, are vegetated basins or landscaped areas that capture stormwater runoff and provide filtration and treatment using engineered filter media. Bioretention areas are flexible per the needs of most site locations.

Design Considerations

- Consists of a grass filter, a sand bed, stormwater ponding area, an organic/mulch layer, planting soil, and selected landscaping for vegetation
- The facility works on any soil group
- Can be designed with an underdrain to send treated water into an outlet
- Use native plants as recommended
- Can be designed in-line or off-line
- Requires a footprint of 5-7% of the tributary impervious area

Key Advantages

- They are highly effective at removing pollutants and reducing peak flow storm events for small storms
- Bioretention areas work well in areas with a small drainage area (recommended for between 2 and 5 acres)
- Bioretention facilities can handle large amounts of impervious areas
- Bioretention areas have relatively low maintenance requirements
- Due to their incorporation of landscaping, bioretention facilities can be used as an aesthetic feature

Limitations

- Landscaping of bioretention facilities in public areas must be maintained to prevent overgrowth
- Bioretention areas cannot be used in areas with steep slopes
- Bioretention areas are not designed to manage peak flows from large storm events

Target Constituent	Removal Rate
Total Suspended Solids	
Total Phosphorus	
Total Nitrogen	
Fecal Coliform	*insufficient data*
Heavy Metals	

Implementation Considerations

Suitability

The iSWM manual has designated that bioretention facilities are suitable for providing:

*In certain situations

Maintenance

- Trash, leaf, debris and sediment removal
- Weeding/removing unwanted vegetation
- Replacing dead and dying vegetation
- Raking and replacing the top mulch layer
- Irrigating plants after planting and during the dry season
- Replace soil media on an as-needed basis
- Clean inlet and outlet pipes when required
- Repair eroded locations

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Stormwater Management

Dry Detention Pond

Description

Dry detention ponds are surface storage facilities that provide detention of stormwater runoff to reduce downstream water quality impacts. They temporarily detain stormwater and gradually release it following storm events. In between storm events, the facilities are typically dry.

Design Considerations

- Dry detention ponds are designed for the maximum reduction of peak flows and runoff reduction for larger storm events
- There are no restrictions for drainage area size
- Soil groups 'A' and 'B' may require a pond liner
- Often used as part of a treatment train to meet water quality requirements

Key Advantages

- Since less excavation is required, dry detention ponds are typically less costly than wet ponds for equivalent flood storage
- Dry detention ponds are often used in conjunction with water quality structural control
- In between storm events, there are opportunities for the facility to be used for recreational activities

Limitations

- Extended detention may provide limited water quality treatment and streambank protection
- The area required for dry detention ponds is greater than the area required for other best management practices

Target Constituent	Removal Rate
Total Suspended Solids	
Total Phosphorus	
Total Nitrogen	
Fecal Coliform	
Heavy Metals	*insufficient data*

Implementation Considerations

Suitability

The iSWM manual has designated that dry detention ponds are suitable for providing:

Maintenance

- Trash, leaf, debris and sediment removal
- Provide removal of vegetation and weeds when overgrowth occurs
- Plant seed or sod in bare or dead spots
- Mow planted vegetation
- Clean inlets

TASK 2 – REORGANIZE/RE-EVALUATE SITE DEVELOPMENT CONTROLS

- Potential Tasks for Implementation Next Year:
  - Update of remaining BMP summary pages
  - Rework of introduction of manual
  - Reorganization/categories
  - Addition of new BMPs
  - Addition of the vegetation list
  - Addition of specifications or design check lists
  - Recommendations of public signage and certification/training received
- Potential Long-Term Implementations:
  - Encourage participation and use of manual and increase in water quality criteria standards throughout the region
  - Set up committee to review and rewrite technical manual

TASK 3 – ISWM DESIGNATION IMPLEMENTATION WORKSHOP

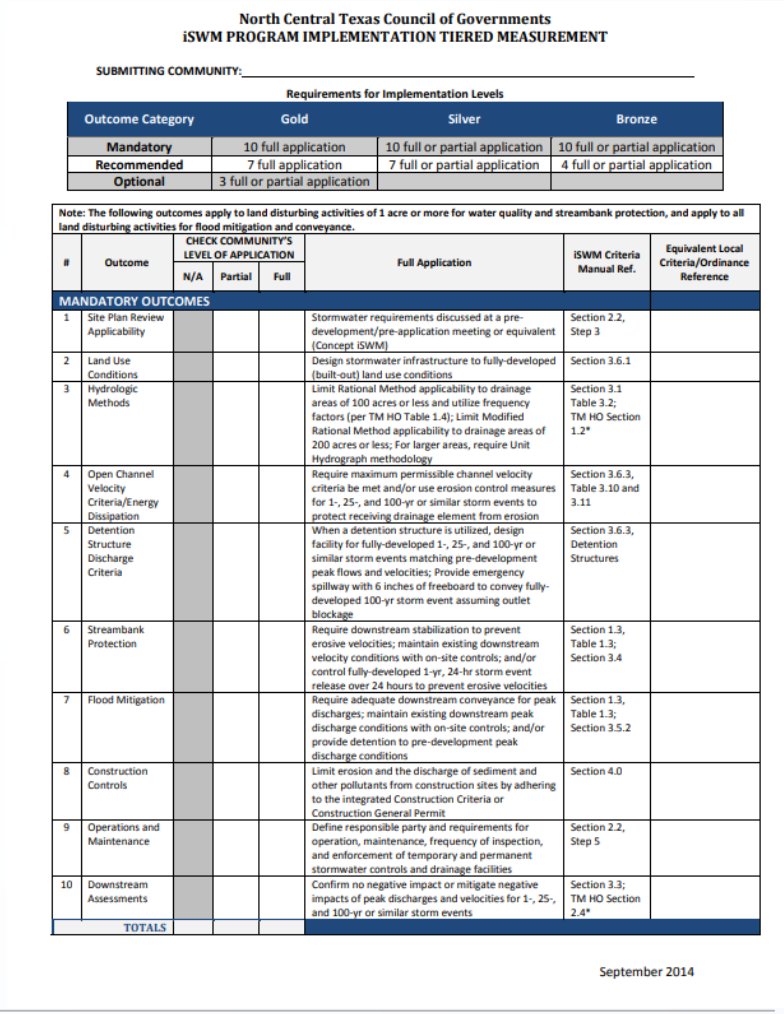
- Workshop #1 – September 5th 2019
  - Met with Corinth & DFW Airport
- Workshop #2 – October 22nd 2019
  - The following municipalities made presentations
    - Frisco – Green Infrastructure
    - Grand Prairie – Flood Mitigation
    - Fort Worth – Streambank Erosion
- Workshop #3 – February 11th 2020
  - Met with DFW Airport, Dallas County, and City of Denton
- No outstanding items

TASK 4 – TECHNICAL MEETING OF ISWM ADOPTERS

- Online Survey – December 9, 2019 to January 31, 2020
- Webinar hosted March 30, 2020
- Memorandum summarizing recommendations sent to subcommittee for review

TASK 5 – ISWM PRINCIPALS REGIONAL REVIEW

- All criteria from iSWM Program Implementation Tiered Measurement has been reviewed for 53 communities
- Developed maps summarizing 7 criteria for 8 counties
- Added watershed boundaries and waterways to maps



North Central Texas Council of Governments
iSWM PROGRAM IMPLEMENTATION TIERED MEASUREMENT

SUBMITTING COMMUNITY:_____

Requirements for Implementation Levels

Outcome Category	Gold	Silver	Bronze
Mandatory	10 full application	10 full or partial application	10 full or partial application
Recommended	7 full application	7 full or partial application	4 full or partial application
Optional	3 full or partial application		

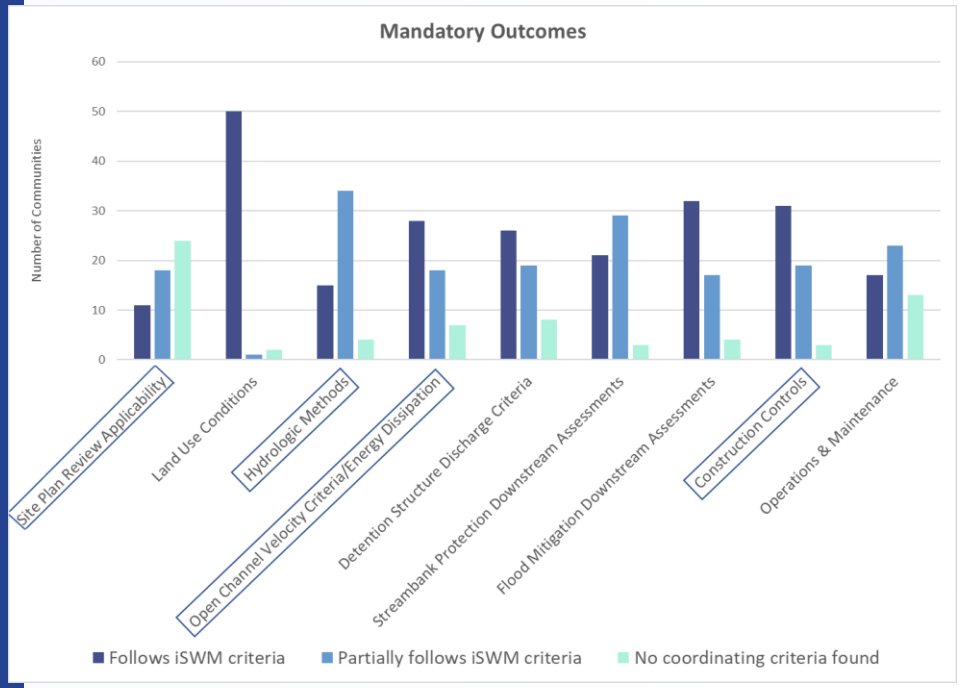
Note: The following outcomes apply to land disturbing activities of 1 acre or more for water quality and streambank protection, and apply to all land disturbing activities for flood mitigation and conveyance.

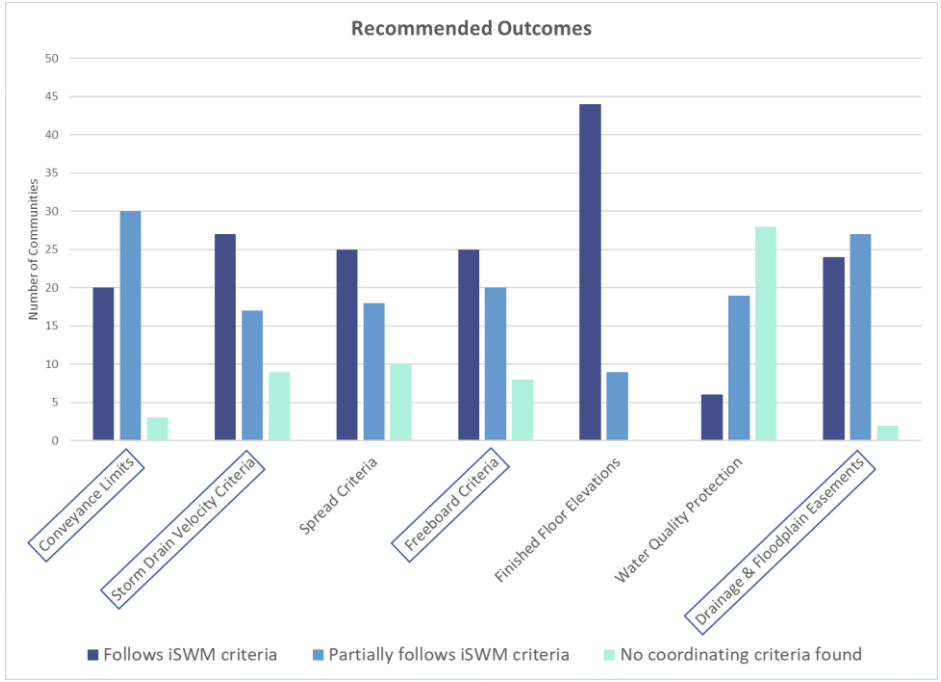
#	Outcome	CHECK COMMUNITY'S LEVEL OF APPLICATION			Full Application	iSWM Criteria Manual Ref.	Equivalent Local Criteria/Ordinance Reference
		N/A	Partial	Full			
MANDATORY OUTCOMES							
1	Site Plan Review Applicability				Stormwater requirements discussed at a pre-development/pre-application meeting or equivalent (Concept iSWM)	Section 2.2, Step 3	
2	Land Use Conditions				Design stormwater infrastructure to fully-developed (built-out) land use conditions	Section 3.6.1	
3	Hydrologic Methods				Limit Rational Method applicability to drainage areas of 100 acres or less and utilize frequency factors (per TM HO Table 1.4); Limit Modified Rational Method applicability to drainage areas of 200 acres or less; For larger areas, require Unit Hydrograph methodology	Section 3.1 Table 3.2; TM HO Section 1.2*	
4	Open Channel Velocity Criteria/Energy Dissipation				Require maximum permissible channel velocity criteria be met and/or use erosion control measures for 1-, 25-, and 100-yr or similar storm events to protect receiving drainage element from erosion	Section 3.6.3, Table 3.10 and 3.11	
5	Detention Structure Discharge Criteria				When a detention structure is utilized, design facility for fully-developed 1-, 25-, and 100-yr or similar storm events matching pre-development peak flows and velocities; Provide emergency spillway with 6 inches of freeboard to convey fully-developed 100-yr storm event assuming outlet blockage	Section 3.6.3, Detention Structures	
6	Streambank Protection				Require downstream stabilization to prevent erosive velocities; maintain existing downstream velocity conditions with on-site controls; and/or control fully-developed 1-yr, 24-hr storm event release over 24 hours to prevent erosive velocities	Section 1.3, Table 1.3; Section 3.4	
7	Flood Mitigation				Require adequate downstream conveyance for peak discharges; maintain existing downstream peak discharge conditions with on-site controls; and/or provide detention to pre-development peak discharge conditions	Section 1.3, Table 1.3; Section 3.5.2	
8	Construction Controls				Limit erosion and the discharge of sediment and other pollutants from construction sites by adhering to the integrated Construction Criteria or Construction General Permit	Section 4.0	
9	Operations and Maintenance				Define responsible party and requirements for operation, maintenance, frequency of inspection, and enforcement of temporary and permanent stormwater controls and drainage facilities	Section 2.2, Step 5	
10	Downstream Assessments				Confirm no negative impact or mitigate negative impacts of peak discharges and velocities for 1-, 25-, and 100-yr or similar storm events	Section 3.3; TM HO Section 2.4*	
	TOTALS						

September 2014

TASK 5 – ISWM PRINCIPALS REGIONAL REVIEW

Cities Summary Table





iSWM Criteria Community Inventory

Land Use Conditions

LEGEND

- Silver Certified
- Follows iSWM criteria
- Partially follows iSWM criteria
- No coordinating critiera found
- Not reviewed

0 50,000 100,000 Feet

Halff Associates, Tetra Tech Inc., and Urban EcoPlan, in partnership with NCTCOG, has completed their Stormwater Criteria Community Inventory.

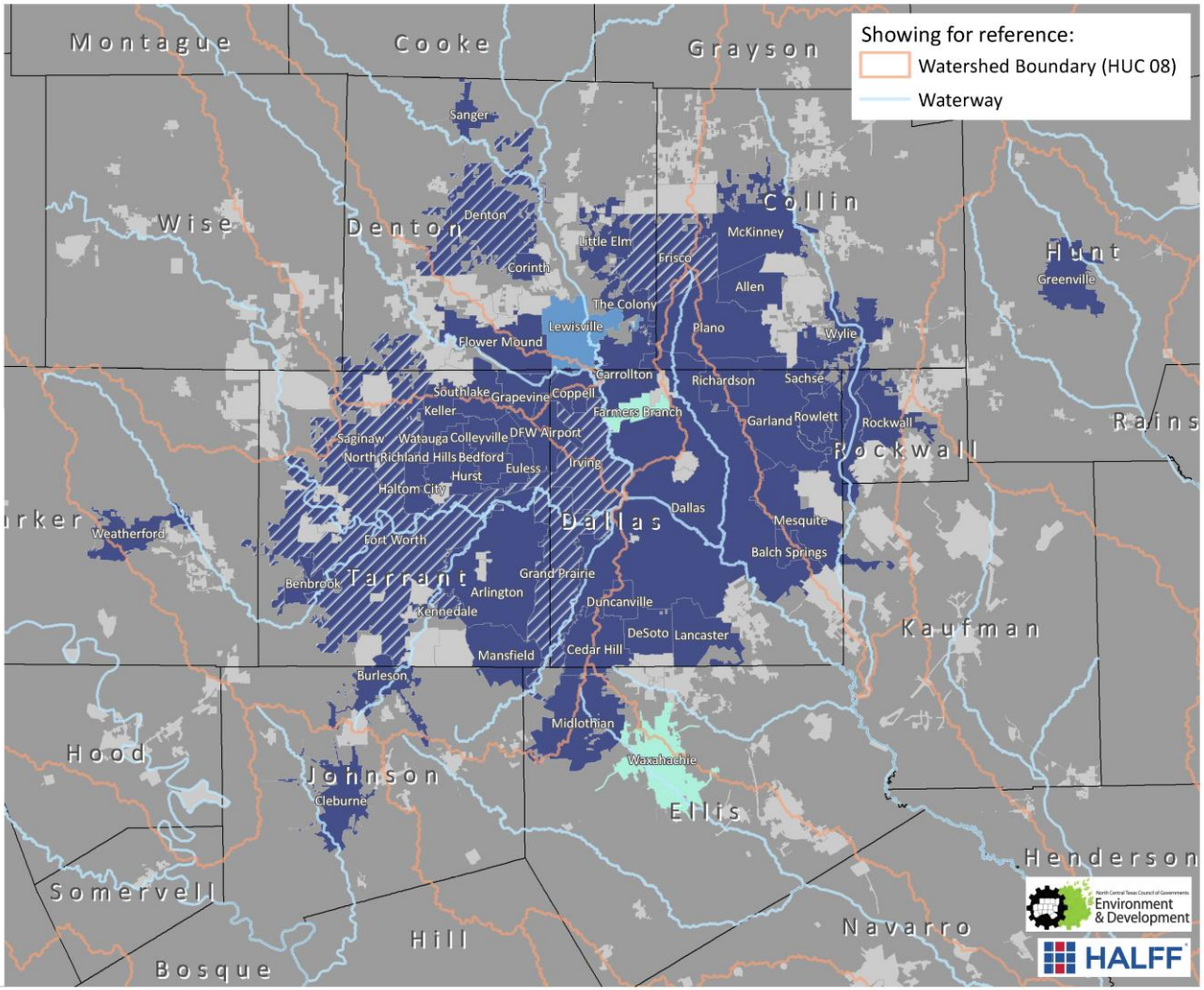
Ordinances and Drainage Criteria Manuals of fifty-three (53) communities were reviewed and compared to seventeen (17) iSWM Design Criteria:

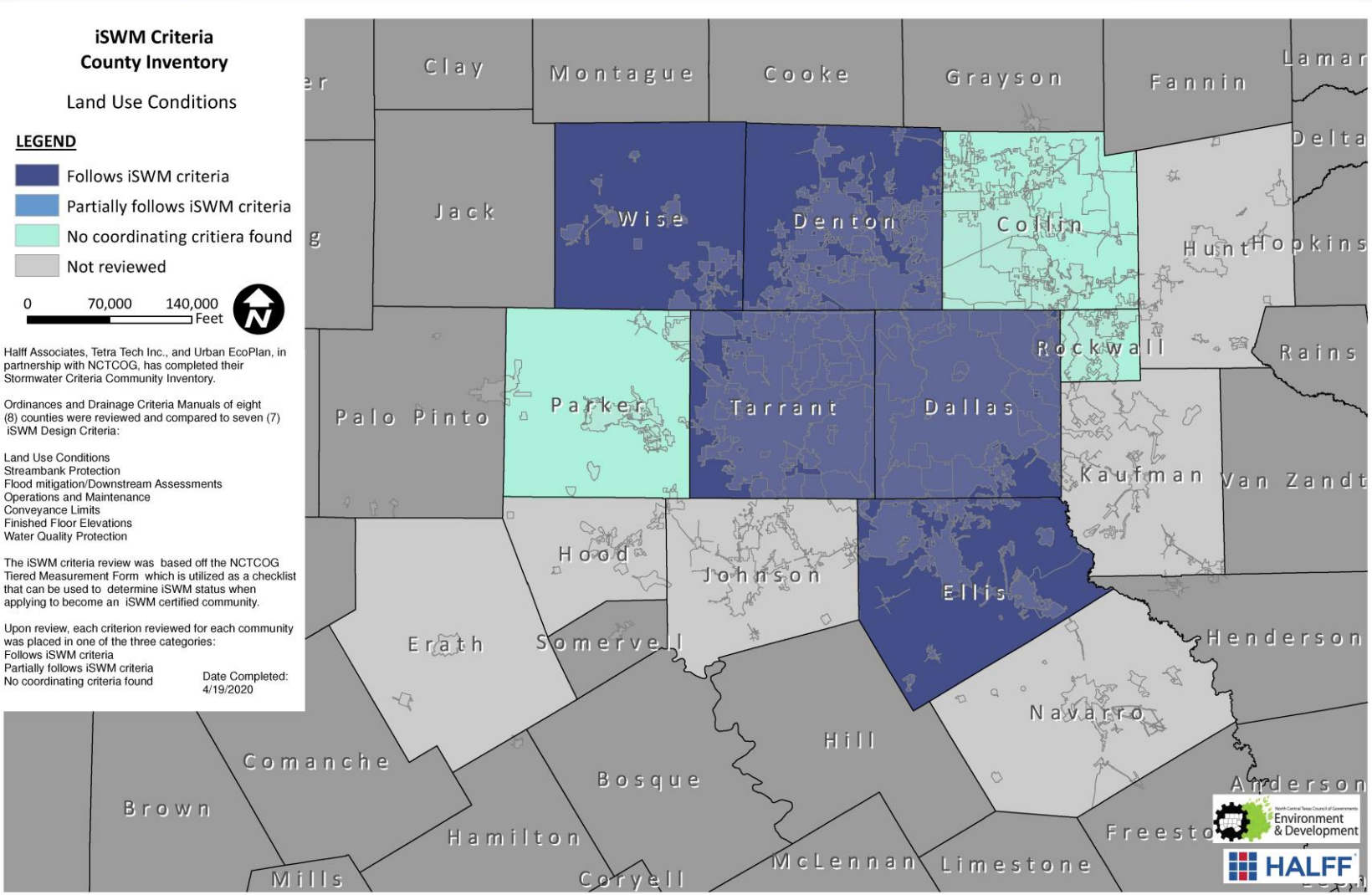
Site Plan Review Applicability
Land Use Conditions
Hydrologic Methods
Open Channel Velocity Criteria/Energy Dissipation
Detention Structure Discharge Criteria
Streambank Protection
Flood mitigation/Downstream Assessments
Construction Controls
Operations and Maintenance
Conveyance Limits
Storm Drain Velocity Criteria
Spread Criteria
Freeboard Criteria
Finished Floor Elevations
Water Quality Protection
Drainage and Floodplain Easements

Data was also collected from an NCTCOG email survey completed in December 2018 asking if use of fully developed land use conditions was required in drainage criteria. The iSWM criteria review was based off the NCTCOG Tiered Measurement Form which is utilized as a checklist that can be used to determine iSWM status when applying to become an iSWM certified community.

Upon review, each criterion reviewed for each community was placed in one of the three categories:
Follows iSWM criteria
Partially follows iSWM criteria
No coordinating criteria found

Date Completed: 4/20/2020




iSWM Criteria
County Inventory
Land Use Conditions
LEGEND
Follows iSWM criteria
Partially follows iSWM criteria
No coordinating critiera found
Not reviewed
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140,000
Feet
Halff Associates, Tetra Tech Inc., and Urban EcoPlan, in partnership with NCTCOG, has completed their Stormwater Criteria Community Inventory.
Ordinances and Drainage Criteria Manuals of eight (8) counties were reviewed and compared to seven (7) iSWM Design Criteria:
Land Use Conditions
Streambank Protection
Flood mitigation/Downstream Assessments
Operations and Maintenance
Conveyance Limits
Finished Floor Elevations
Water Quality Protection
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Date Completed:
4/19/2020
Clay
Montague
Cooke
Grayson
Fannin
Lamar
Delta
Jack
Wise
Denton
Collin
Hunt
Hopkins
Rockwall
Rains
Palo Pinto
Parker
Tarrant
Dallas
Kaufman
Van Zandt
Hood
Johnson
Ellis
Henderson
Erath
Somervell
Navarro
Hill
Comanche
Bosque
Anderson
Brown
Hamilton
Freestone
Mills
Coryell
McLennan
Limestone
Environment & Development
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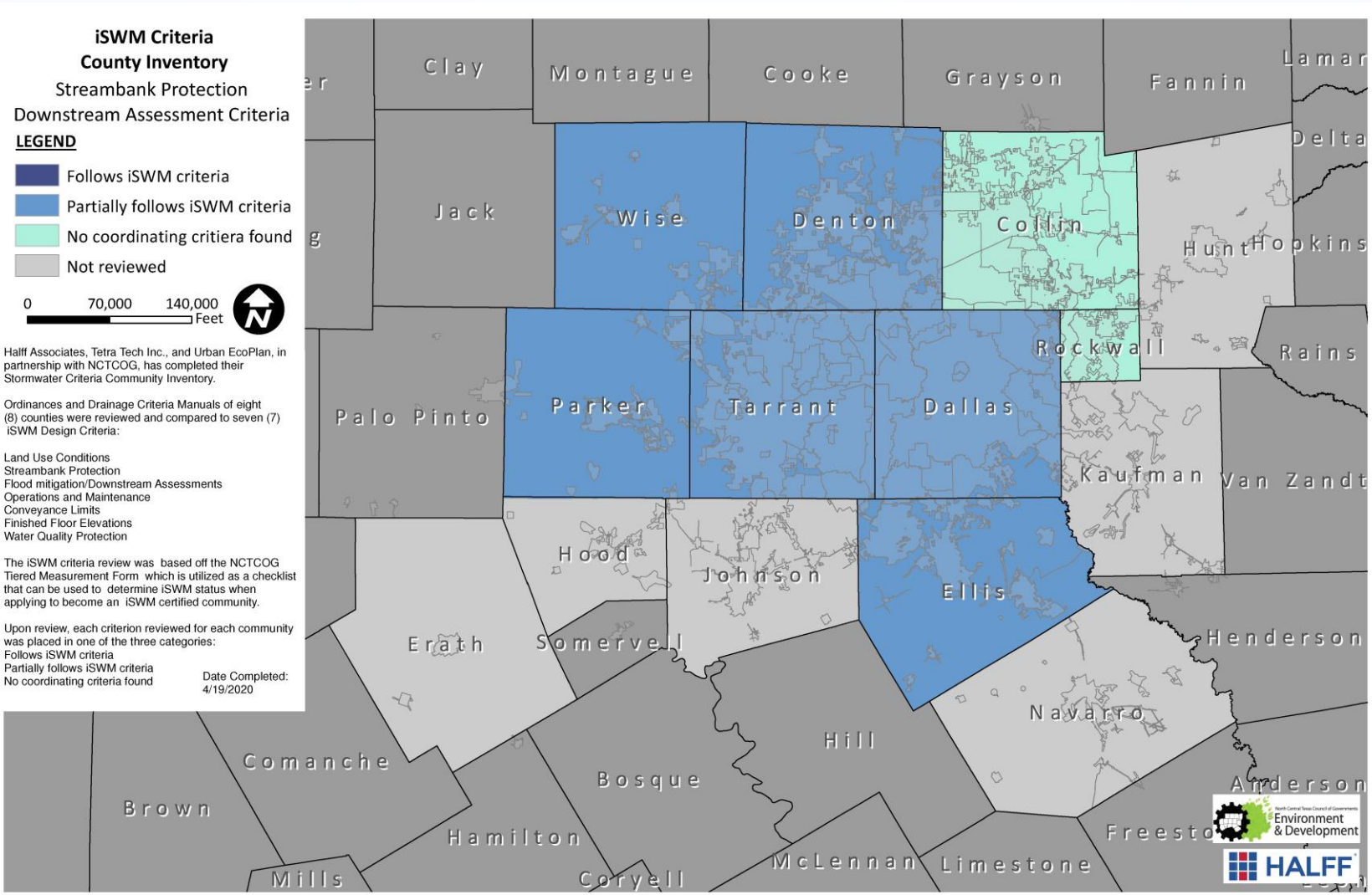
iSWM Criteria
County Inventory
Streambank Protection
Downstream Assessment Criteria
LEGEND
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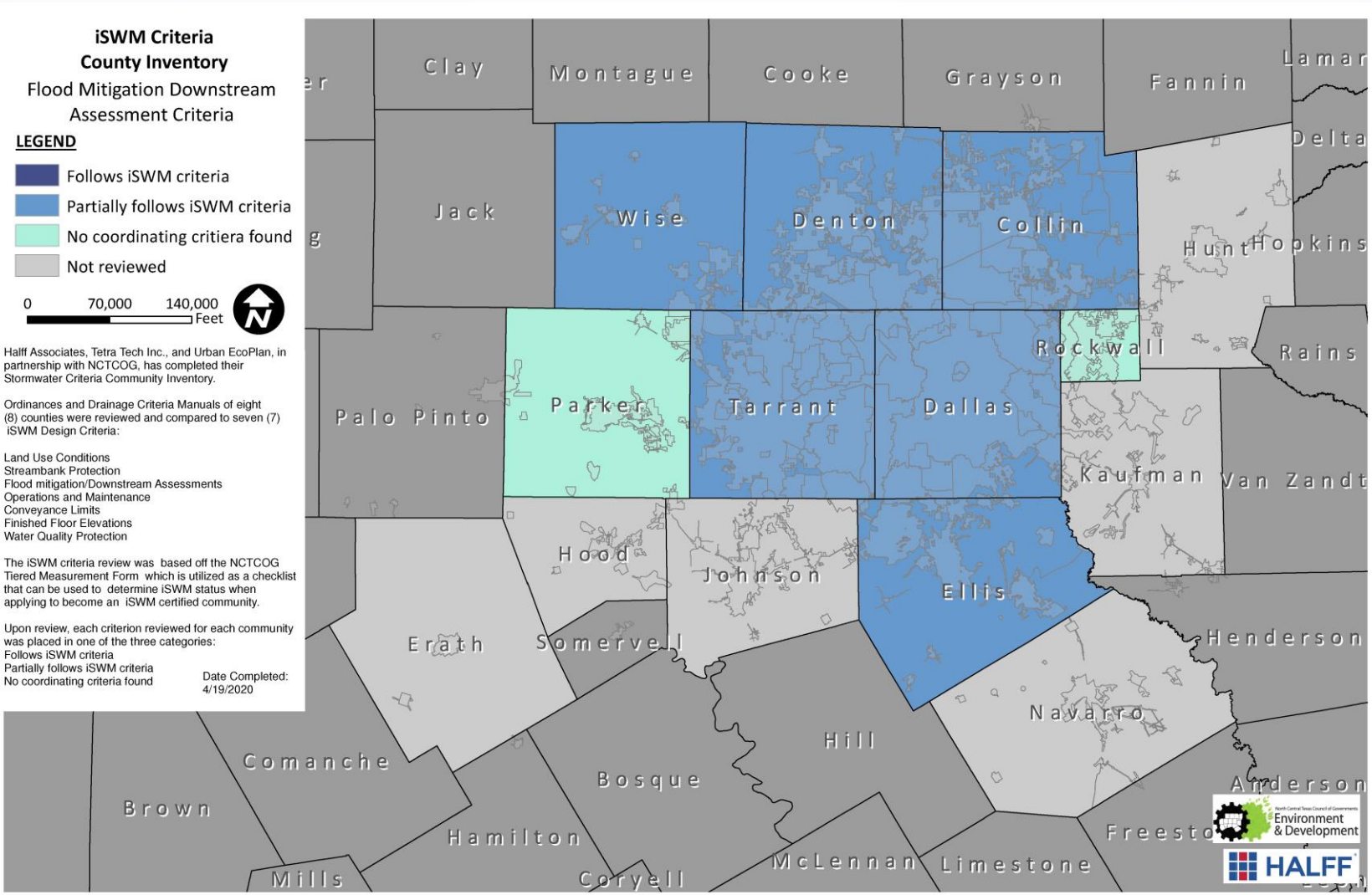
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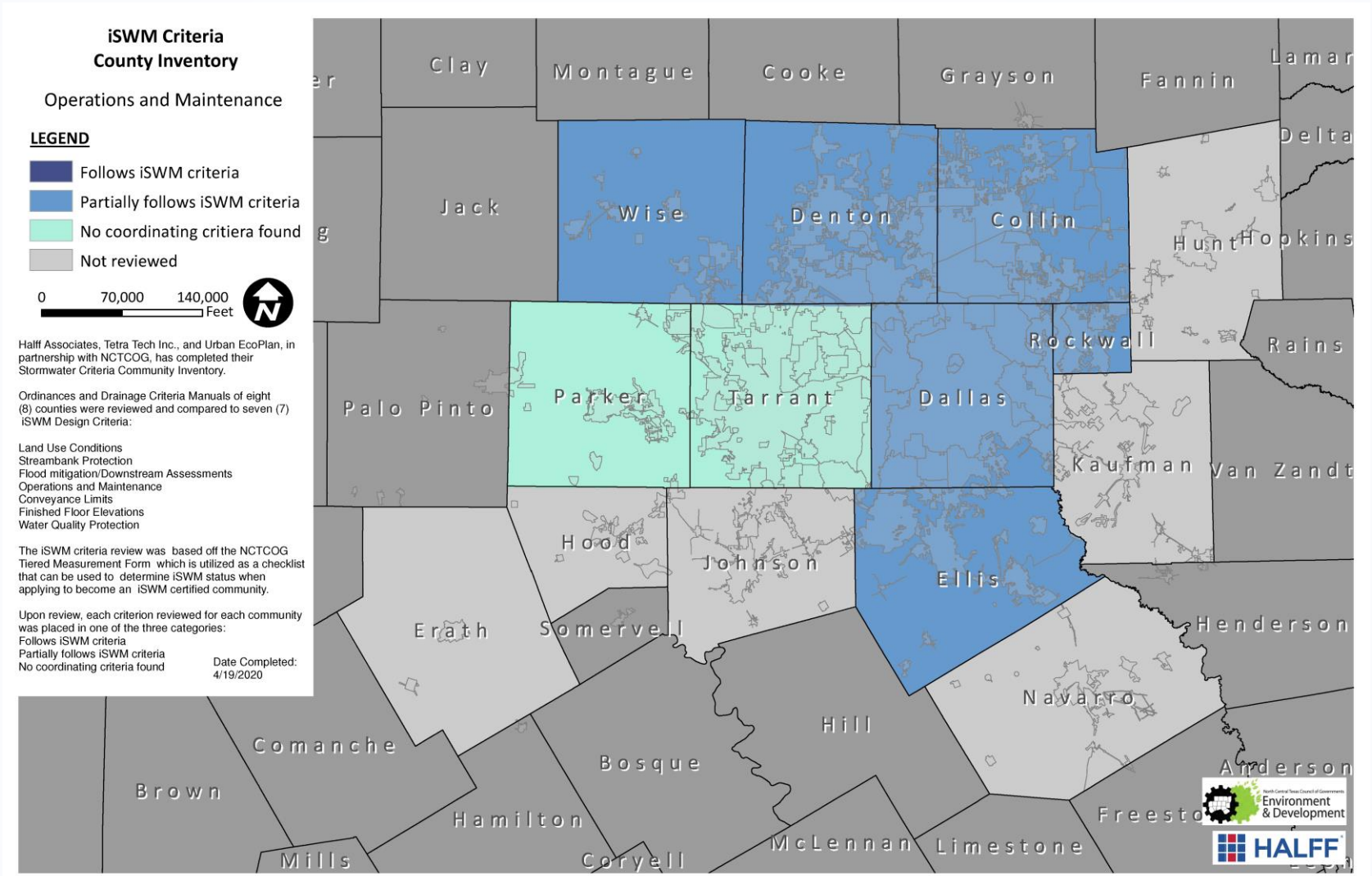
iSWM Criteria
County Inventory
Operations and Maintenance
LEGEND
Follows iSWM criteria
Partially follows iSWM criteria
No coordinating critiera found
Not reviewed
0
70,000
140,000
Feet
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Conveyance Limits
Finished Floor Elevations
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Fannin
Lamar
Delta
Jack
Wise
Denton
Collin
Hunt
Hopkins
Rockwall
Rains
Palo Pinto
Parker
Tarrant
Dallas
Kaufman
Van Zandt
Hood
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Ellis
Erath
Somervell
Henderson
Navarro
Hill
Comanche
Bosque
Anderson
Brown
Hamilton
Freestone
Mills
Coryell
McLennan
Limestone
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iSWM Criteria
County Inventory

Conveyance Limits

LEGEND

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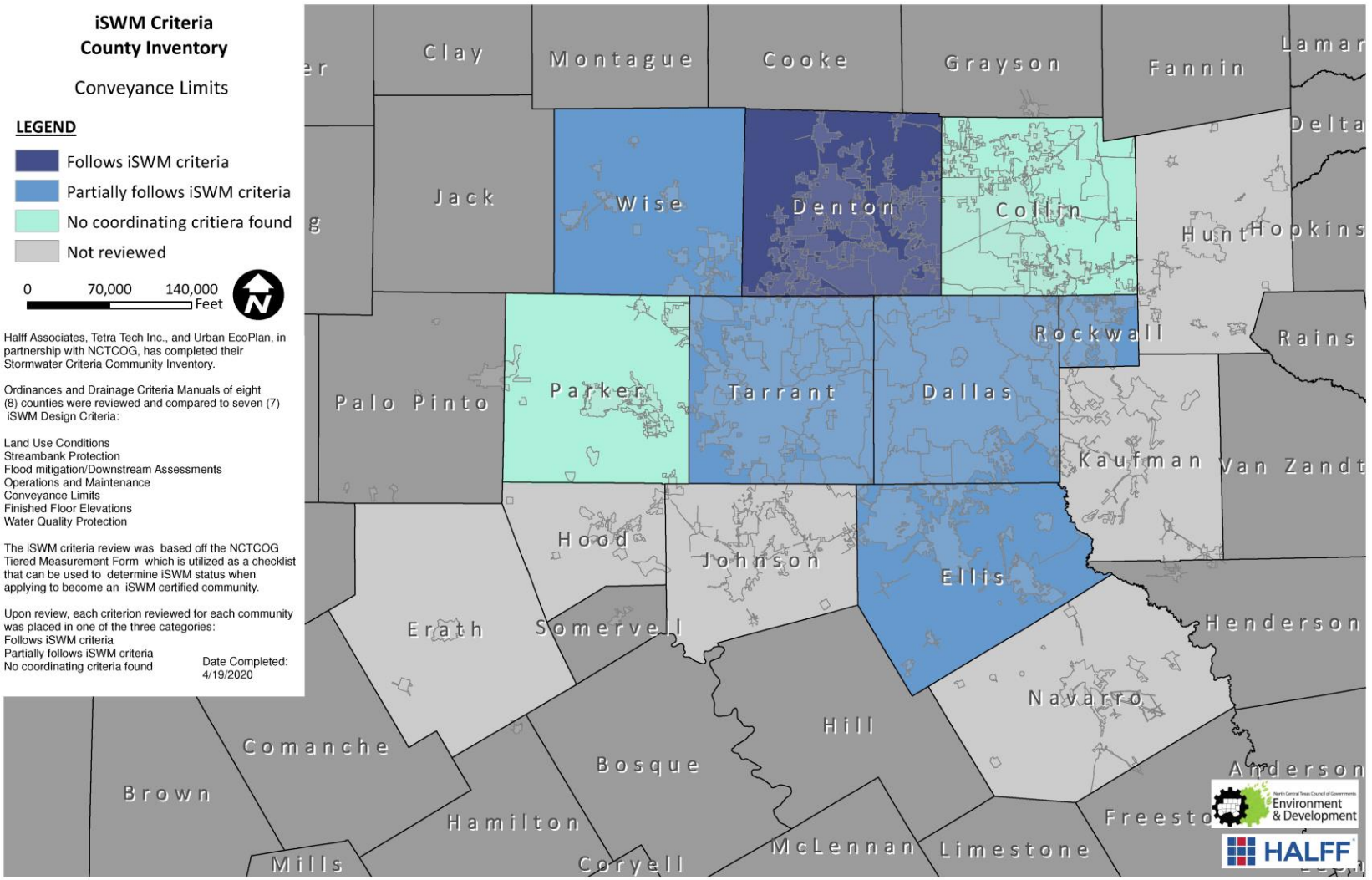

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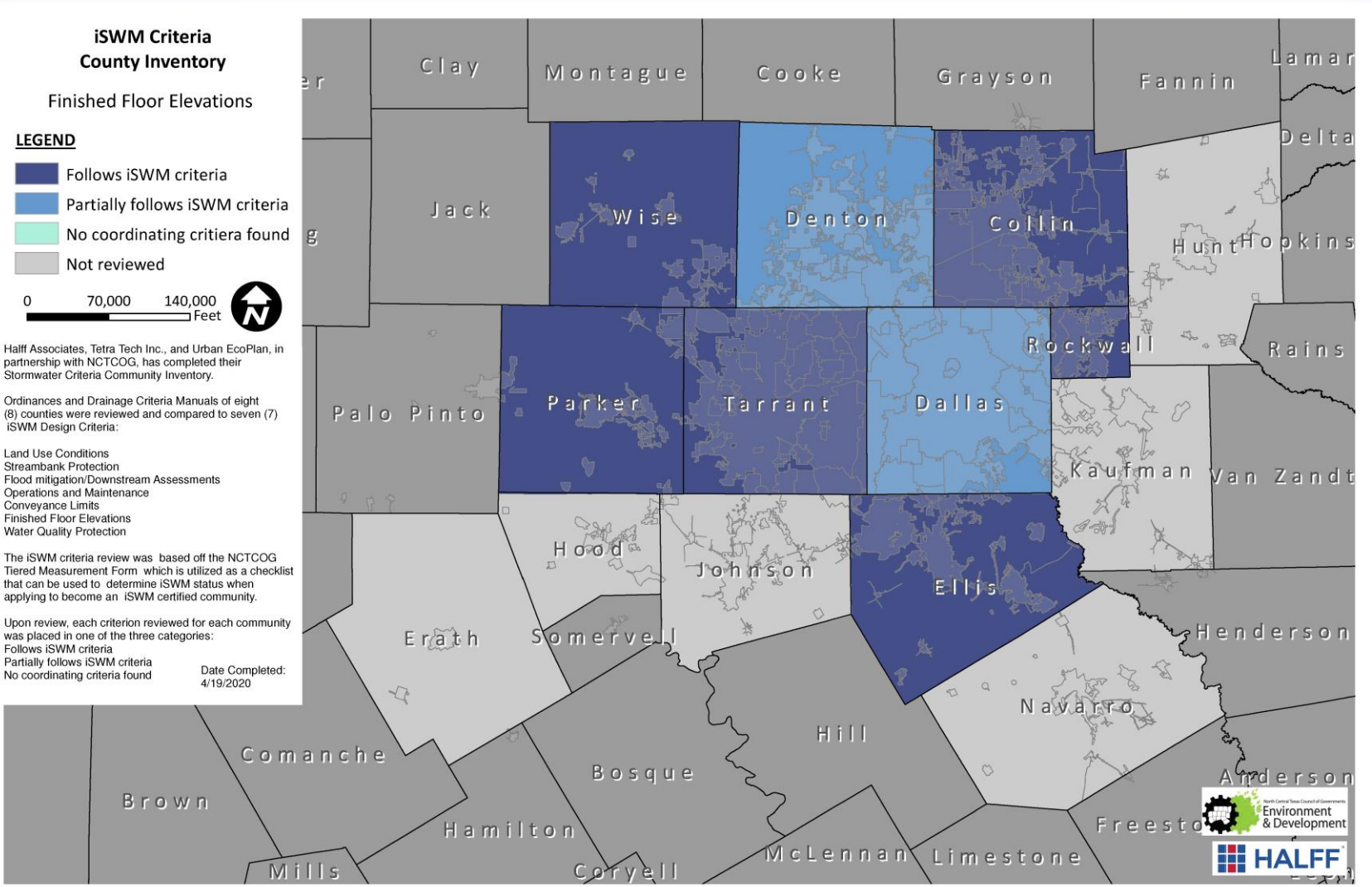
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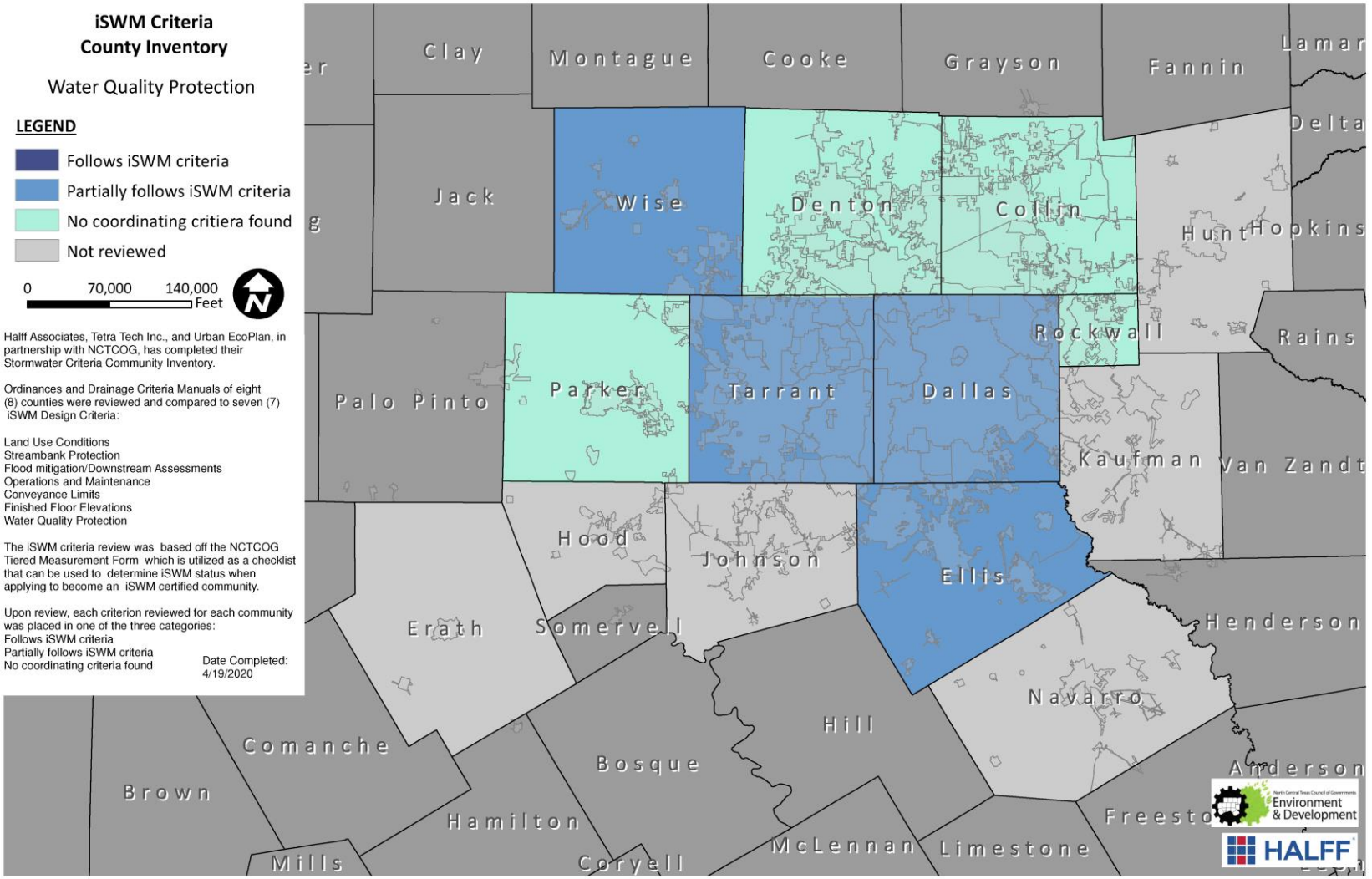
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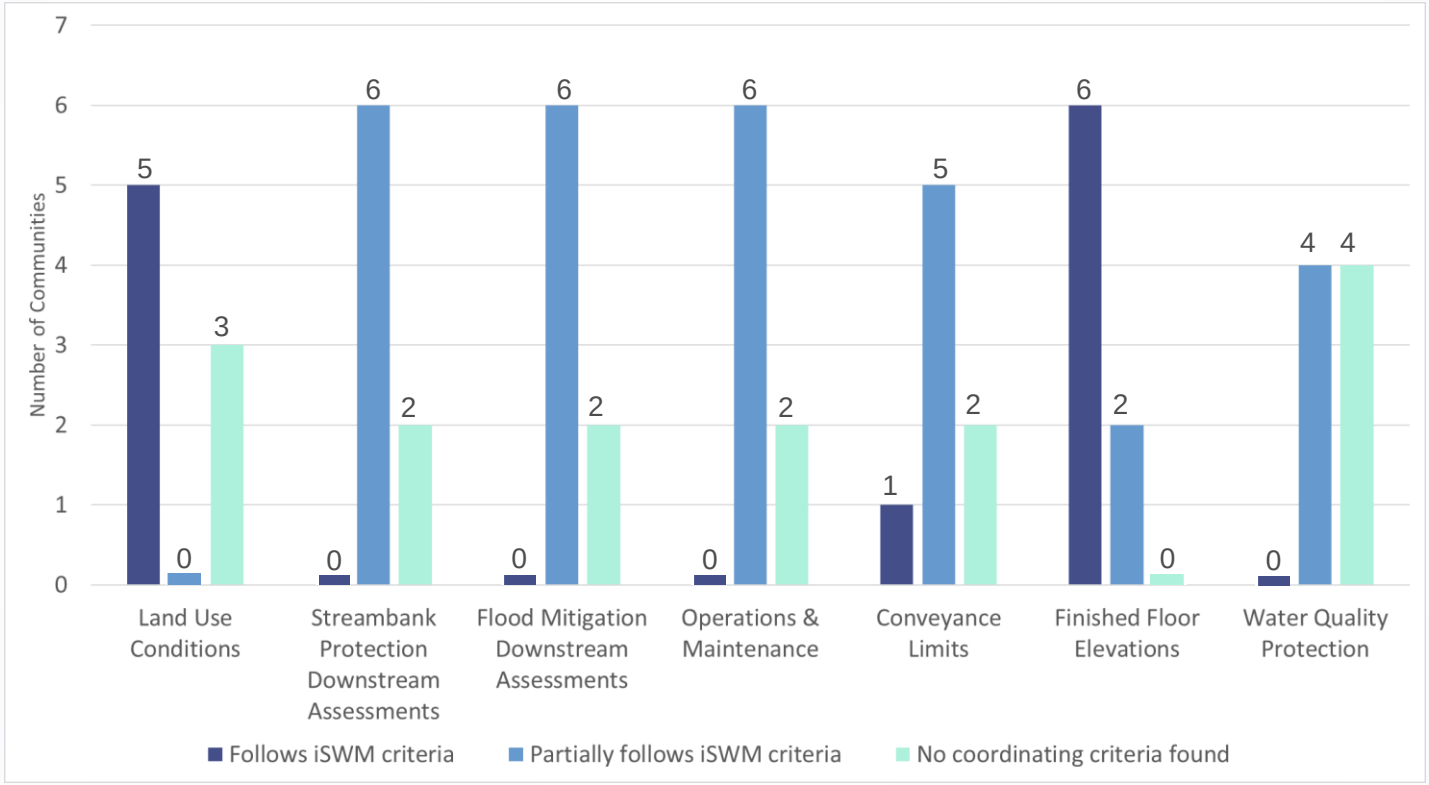
TASK 5 – ISWM PRINCIPALS REGIONAL REVIEW

Counties Summary Table

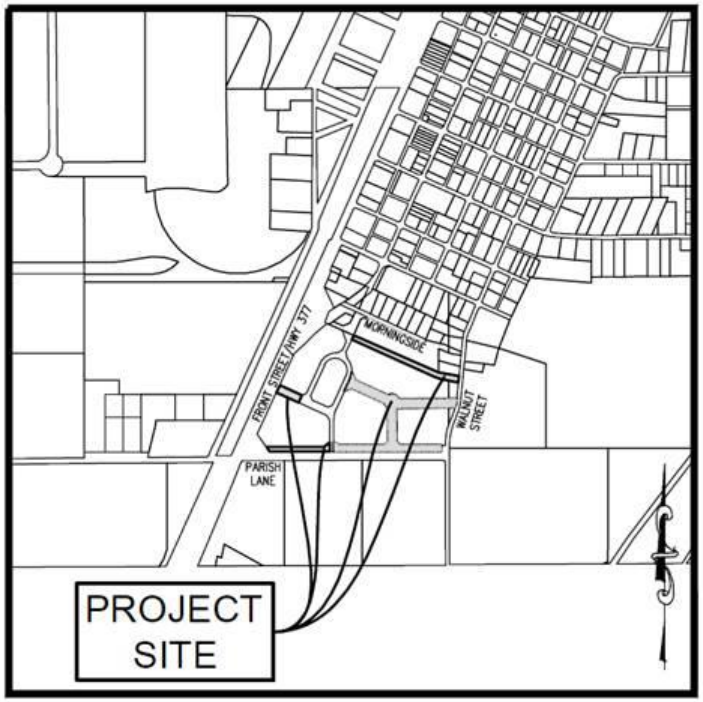


TASK 6 – UPDATE TECHNICAL MANUAL RAINFALL INTENSITIES

- Changes have been updated to manual
- USGS rainfall tables were removed and replaced
- COG will implemented on the iSWM website

TASK 7 – ISWM BMP INSTALLATION VIDEOS

- Video has been developed entitled:
  - "Bioretention Facility Installation and Maintenance in Roanoke, Texas"
- Not a case study because we were not able to get the city involved
- What: Two bioretention systems one being 90 SF and the other 200 SF
- Designed and Installed by Construction Ecoservices
- Location: Roanoke Town Center, Roanoke, TX



Work Scope: Task Order 4 and contract extension

Halff drafted Task Order No. 4 (handout).

The following tasks have been outlined for Task Order No. 4 with completion by April 30, 2021

1. Project Management and Meeting Attendance
2. Reorganize/Re-evaluate Site Development Controls
3. Guidance on developing a regional detention program
4. Detention criteria guidance research
5. Re-evaluate 85th Percentile (1.5") Rainfall Requirements
6. 5-Year Outreach and Implementation Strategy
7. Provide details and specifications for water quality BMPs

Action needed by the subcommittee to approve this Task Order.

iSWM certified communities' participation in the Public Works Program

Discussion iSWM certified communities' participation in the Public Works Program.

Public Works Program Updates

Public Works Council

- The Public Works Roundup has been postponed to Sept. 17, 2020. If you would like to submit an abstract or are interested in sponsoring the Roundup please contact Olivia Kale at okale@nctcog.org or (817) 695-9213.

Sustainable Public Rights of Way (SPROW) Subcommittee

- SPROW is working towards creating a Best Management Practices Guidebook. They are focusing on Landscape Planning/Maintenance and will begin discussing tree lists and ordinances at the next meeting. https://www.nctcog.org/envir/committees/public-works-council/sustainable-public-rights-of-way-subcommittee

Standard Drawings Subcommittee

- The subcommittee finished comments on Division 3000 and is now working on Division 2000: Pavement Analysis. Division 1000 edits are being prepared by NCTCOG staff to be released in the final format.

Upcoming Events and Conferences

APWA Texas Chapter Conference
Tentative Date: June 17-19, 2020
Location: Galveston, TX
Register at: https://txapwa.com/

Public Works Roundup
Date: September 17, 2020
Location: Richardson Civic Center
More information: https://www.nctcog.org/envir/public-works/annual-public-works-roundup

Now, It's YOUR Turn...

Upcoming NCTCOG Meetings

- Next iSWM Meeting, **July 8, 2020**
- Regional Stormwater Management Council, May 20
- Public Works Council Standard Drawings Subcommittee, April 13
- Public Works Council Sustainable Public Rights of Way, TBD
- Public Works Council Meeting. May 7

Contact

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Edith Marvin
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