

Source: Public Works

Agenda Item No: REP 16-14

To: City Council
From: City Manager and Staff

Council Meeting Date: Feb 17, 2014

Re: Aldeah - Sewer and Stormwater Issues (CM #3887)

EXECUTIVE SUMMARY:

Staff has prepared for Council consideration a report summarizing sanitary sewer and stormwater issues along Aldeah Avenue.

DISCUSSION:

At the June 3, 2013 Council meeting, staff was directed to investigate projects or repairs that could remedy sewer backups along Aldeah Avenue. In addition, a map of the sanitary sewer and stormwater infrastructure in this area, and a list of known complaints, was requested. Following is a summary of projects the City has completed, and proposed activities the City can perform to help reduce the frequency of backups in this area.

The attached Exhibit 1 is a map showing the sanitary sewer and stormwater infrastructure along Aldeah Avenue and the surrounding area. The map identifies properties that have contacted the City with storm drainage concerns, and properties that have notified the City of sanitary sewer backups during times of heavy rainfall.

In addition to the map, the following are included:

- Table 1: Stormwater drainage complaints reported by residents since 1993.
- Table 2: Stormwater concerns from residents in the Aldeah Avenue area from a questionnaire the City sent in preparation for stormwater drainage improvements that were completed in 2002.
- Table 3: Sanitary sewer backups due to heavy rainfall reported to the City.

The following is a brief summary of stormwater and sanitary sewer problems, and infrastructure improvements in this area:

Stormwater:

The majority of properties experiencing problems with stormwater and sanitary sewer on Aldeah Avenue are located within a regulated floodplain, as shown in Exhibit 1. These properties were developed prior to the City having any ordinances regulating construction in a floodplain overlay district. Current regulations would not allow for the construction of many of these buildings at their current elevation. Properties located within a regulated floodplain are more susceptible to surface water flooding, structure flooding, and street flooding than properties outside floodplain areas.

Table 1 is a list of storm drainage complaints received since 1993 when the Public Works department began maintaining records of the complaints. Due to the complaints of flooding, the original drainage system in this area was replaced as part of a large public stormwater infrastructure improvement project in 2002. As part of the improvement project, the City sent questionnaires to property owners requesting information about stormwater issues on their property that could be addressed with the improvement project. **Table 2** is a summary of the responses. The improvement project included the construction of an 8.5' x 3' concrete culvert to convey the stormwater runoff from upstream areas, and a piped stormwater conveyance system on Aldeah Avenue. In addition, this project included the replacement of some of the original sanitary sewer system. This included eliminating one private common collector sewer and relocating a portion of the public sewer that had residential structures built over it. This project, and private improvement projects, have

currently addressed all surface water house flooding issues in this area. Since these improvements have been completed, surface flooding complaints have decreased.

Sanitary Sewer:

The sanitary sewers in this area were constructed as part of Sewer District 28. This Sewer District was created in 1911 and the sewers were constructed in years following. A portion of the original sewer on Aldeah Avenue was replaced with the previously mentioned stormwater improvement project. The majority of the remaining sewers in this area have been rehabilitated by placing a liner in the original sewer main. **Table 3** includes a list of reported sanitary sewer backups into buildings in this area during heavy rainfall.

Discussion:

These sanitary sewer backups are due to rainwater getting into the sanitary sewer system, and is commonly referred to as inflow and infiltration, or I&I. The rainwater gets into the sanitary sewer system in many different ways:

- cracks in public sewer pipes or private sewer service lines and connections,
- cracks or holes in sewer manholes,
- direct connections of storm drains to the sanitary sewer system,
- foundation drains connected to the sanitary sewer system,
- sump pumps connected to the sanitary sewer system,
- downspouts connected to the sanitary sewer system.

The City has separate sanitary sewer and stormwater systems. The sanitary sewer system was not designed to convey stormwater. The aging public sanitary sewer infrastructure, and the direct connections from private property allow rainwater into the sanitary sewer system. Heavy rainfall exceeds the capacity of the sanitary sewer causing the sewer to surcharge, resulting in either sanitary sewer overflows to the environment and/or backups into buildings.

Currently, the City is performing Sanitary Sewer Evaluation Studies (SSES) in individual sanitary sewer basins. These studies include field surveys and inspections, data analysis, model development and recommendations for improvement to reduce the amount I&I getting into the sanitary sewer system. The field surveys and inspections identify public and private sources of I&I into the sanitary sewer. The studies have been completed in four basins, including the Aldeah area, and ongoing in two additional basins.

The City has an existing I&I reduction program that addresses sources of I&I identified in the SSES. This program is removing some private sources of I&I through a reimbursement program for owner occupied residences. These reimbursable repairs include re-routing sump pumps, disconnecting downspouts, installing clean-out caps and repairing lateral connections. The City is currently rehabilitating existing sewer mains and manholes to remove some of the public sources of I&I. The 2013 Sewer Bond will provide additional funding to continue system rehabilitation in the basins that have been studied.

Improvements to remove public and private sources of I&I will reduce the amount of rainwater entering the sanitary sewer system. This reduction will reduce the frequency, severity, and duration of the building backups and sanitary sewer overflows currently being experienced. However, this program and the improvements will not eliminate all of the backups and overflows. Example: a house that experiences a backup due to a 1.75 inch rainfall, currently may not experience a backup or overflow unless there is a 3 inch or greater rainfall once the improvements are completed. There are over 500 properties that are connected to the sanitary sewer main upstream of the properties on Aldeah Avenue. Properties along Aldeah Avenue will continue to experience backups during significant rainfall until all of the sources of I&I on these properties, and on the public sewer system, are removed. Even with all sources removed, the allowable infiltration may still be sufficient to cause some homes to experience backups during periods of significant rainfall. In addition, pipes that are in good condition now will deteriorate as they age and begin allowing more I&I into the system. This is likely not acceptable for most property owners. The only way to reasonably ensure a building will not be susceptible to backups is to modify the plumbing system for the individual building. This can be accomplished in different ways:

- removing all sewer plumbing for the basement,
- installation of a backflow prevention device on the sewer lateral,
- installation of stand pipes on floor drains,
- convert the basement portion of the sewer to a pressure sewer system by installation of a pump.

There are other modifications and each is unique to the property.

The simplest, however least reliable, method to remedy backups is to install a backflow prevention device on the lateral. Backflow prevention devices often fail to function properly and will not work if foundation drains are connected to the lateral, or if the existing lateral is in poor condition.

There are some communities and sewer service providers that have backup prevention programs that provide financial assistance to property owners for modifications to building plumbing systems to reasonably ensure the buildings are safe from backups due to rain events. Staff can investigate these programs and provide a recommendation on creating a backup prevention program to Council, if desired.

FISCAL IMPACT:

None with this report.

VISION IMPACT:

<http://www.gocolumbiamo.com/Council/Meetings/visionimpact.php>

None

SUGGESTED COUNCIL ACTIONS:

For information only.

FISCAL and VISION NOTES:					
City Fiscal Impact Enter all that apply		Program Impact		Mandates	
City's current net FY cost	\$0.00	New Program/ Agency?	No	Federal or State mandated?	No
Amount of funds already appropriated	\$0.00	Duplicates/Expands an existing program?	No	Vision Implementation impact	
Amount of budget amendment needed	\$0.00	Fiscal Impact on any local political subdivision?	No	Enter all that apply: Refer to Web site	
Estimated 2 year net costs:		Resources Required		Vision Impact?	Yes
One Time	\$0.00	Requires add'l FTE Personnel?	No	Primary Vision, Strategy and/or Goal Item #	9
Operating/ Ongoing	\$0.00	Requires add'l facilities?	No	Secondary Vision, Strategy and/or Goal Item #	9.1
		Requires add'l capital equipment?	No	Fiscal year implementation Task #	

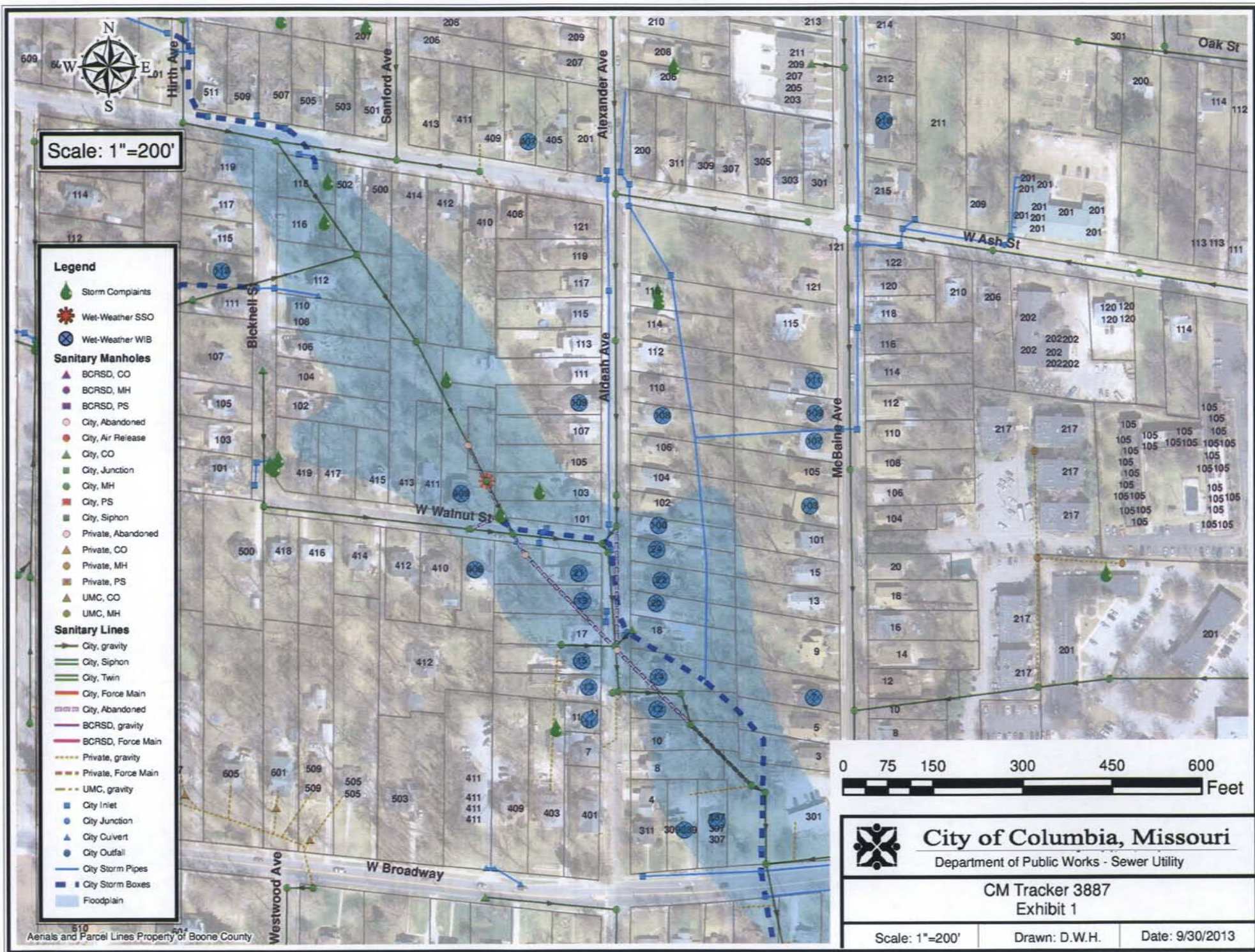


Table 1								
Storm Water Drainage Complaints - Aldeah Avenue								
Date	Address	House Flooding	Yard Erosion	Open Channel	Yard Flooding	Leaky Basement	Floor Drain	Street Flooding
10/7/1993	Aldeah Ave 11						X	
2/11/1998	Aldeah Ave 17			X				
8/27/1999	Aldeah Ave 19	X		X		X		X
9/12/2000	Aldeah Ave 12						X	
6/9/2001	Aldeah Ave 17					X	X	
3/26/2004	Aldeah Ave 103				X			
9/20/2005	Aldeah Ave 116	X						
4/24/2007	Aldeah Ave 111		X	X				
7/10/2007	Aldeah Ave 101			X				
7/2/2008	Aldeah Ave 116	X						
2/8/2011	Walnut 419 W.			X	X			

Table 2

Responses to Questionnaires Sent Prior to a Storm Water Improvement Project

Aldeah, Ash Bicknell and Walnut 2002

	Address	House Flooding	Yard Erosion	Open Channel	Yard Flooding	Leaky Basement	Floor Drain	Street Flooding
	Aldeah Ave 19	x				x	x	x
	Aldeah Ave 13							x
	Aldeah Ave 17							
	Aldeah Ave 21					x		
	Aldeah Ave 21	?		x		x		x
	Aldeah Ave 101	x					x	x
	Aldeah Ave 105	x				x		
	Aldeah Ave 107					x	x	x
	Aldeah Ave 111	x		x	x		x	
	Aldeah Ave 113					x		
	Aldeah Ave 115					x		
	Aldeah Ave 117				x	x		
	Aldeah Ave 119					x		
	Ash St 502					x	x	
	Ash St 505						x	
	Ash St 507							
	Ash St 509				x			x
	Bicknell St 101	x			x	x		
	Bicknell St 106	x		x	x	x		
	Bicknell St 107					x		
	Bicknell St 108 - 110	x		x		x	x	
	Bicknell St 111						x	
	Bicknell St 113					x		
	Bicknell St 116	x	x	x				x
	Bicknell St 117							
	W Walnut 406	x		x	x	x	x	x
	W Walnut 409	x		x	x	x		x
	W Walnut 411				x			
	W Walnut 412.5					x		x
	W Walnut 413		x			x		
	W Walnut 414							x
	W Walnut 415				x			
	W Walnut 417							
	W Walnut 418					x		
	W Walnut 419							
	W Walnut 500	x		x		x	x	
	W Walnut 504			x	x	x	x	x

Table 3																			
Rainfall Related Sanitary Sewer Backups - Aldeah and Walnut																			
Address	Dates of Backups due to surcharged sanitary sewer																		
	06/25/68	02/22/79	07/22/81	11/18/85	05/03/90	05/15/90	11/25/92	02/24/01	03/26/04	09/19/05	07/30/08	04/30/09	02/24/10	07/07/10	08/20/10	04/11/13	04/16/13	05/27/13	05/31/13
11 Aldeah		X		X															
12 Aldeah								X	X										
13 Aldeah	X													X					
14 Aldeah		X	X						X										
15 Aldeah	X					X						X	X	X	X				
19 Aldeah	X																		
20 Aldeah											X	X							
21 Aldeah										X				X					
22 Aldeah									X					X		X	X	X	X
24 Aldeah									X										
100 Aldeah									X				X	X					X
108 Aldeah							X												
109 Aldeah									X										
406 W. Walnut					X														X
409 W. Walnut														X					X