NEW MEXICO STATE UNIVERSITY

MAIN CAMPUS SEWER SYSTEM IDENTIFICATION

FINAL REPORT OF FINDINGS

FEBRUARY, 2015



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Executive Summary

Molzen Corbin has been contracted with New Mexico State University (NMSU) to provide sanitary sewer identification services for a number of buildings north of the International Mall and south of University Avenue. The City of Las Cruces believed NMSU to have storm sewer connections to their sanitary sewer system which would result in higher volumes of water entering the City sanitary system during rain fall events. Molzen Corbin then contracted Southwest Envirotec to assist with a smoke test as well as sewer line television services, and dye testing to identify line locations within the NMSU sanitary sewer system. Succeeding the work provided by Southwest Envirotec, Tierra Surveys would provide a survey of the work performed.

There were two buildings where smoke test results were not obtained including Gardiner Hall and Garcia Hall. No points of storm water infiltration were noted at any of the other locations with the exception of cleanouts missing plugs.

Garcia Hall as well as Gardiner Hall may require further testing to determine if storm water does indeed infiltrate the sanitary sewer system. Drop inlets inside the Garcia Hall patio, on the north east side of Gardiner Hall, and at Dan Williams Hall were noticed to exist with unknown outlet locations. Smoke was not seen at any of these drop inlets, but Gardiner Hall and Garcia Hall were unable to be tested for various constraints including manhole depth and flow conditions. Further investigation of the drop inlets at the various locations is recommended. Televising the drop inlets or performing some sort of dye test could help with location of the outlets. Smoke testing Garcia Hall is recommended when school is not in session.

During the investigation, several buildings were found to tie into the City system through an unmetered flow location. These buildings included Gardiner Hall, Kent Hall, the Business Complex, Health and Social Services, Dan Williams Hall, Barnes and Noble, and the northeast section of the Chemistry Building. These buildings should have a percentage of their water billing, or a fixture count completed to determine a sanitary sewer billing rate to the City.



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1.0 INTRODUCTION

Molzen Corbin has been contracted with New Mexico State University (NMSU) to provide Sanitary Sewer Identification Services. NMSU would like to identify all connections to the City of Las Cruces sanitary sewer system for accurate identification of flows that leave NMSU properties. In addition, the City is concerned about inflow from storm water sources that should be eliminated. NMSU would also like to identify specific discharge locations of various buildings, particularly buildings with multiple sewer services.

The NMSU sanitary sewer system was evaluated based on a smoke test, television inspection, and a survey. The sanitary sewer lines were smoke tested from manhole to manhole to identify sanitary sewer connection points. The lines were then cleaned and televised for mapping purposes. A final survey was completed succeeding the television inspection to provide a sewer map update.



2.0 PROJECT PURPOSE & NEED

The Environmental Protection Agency (EPA) issued a policy in 1994 requiring municipalities to make improvements to reduce or eliminate combined sewer overflow related pollution problems. The Clean Water Act was revised in 2000 requiring municipalities to follow the 1994 policy regarding combined sewers. The City of Las Cruces is concerned about inflow from storm water sources that should be eliminated. NMSU sanitary sewer flow discharges into the City of Las Cruces system at two points, before being treated at the Waste Water Treatment Plant (WWTP). Flows at the treatment plant increase during heavy rainfall events leading to speculation that there is a storm water infiltration point(s) into the sanitary sewer system.

The City claims that NMSU has storm water routed to the City of Las Cruces sanitary sewer system at a point or multiple points within the project limits. Existing NMSU infrastructure built prior to 1994 may not have been required to separate sanitary sewer and storm sewer flows. Therefore, it is necessary to test NMSU infrastructure for cross connections. If cross connections are found, the issue will be addressed and resolved.



3.0 PROJECT SCOPE & OBJECTIVE

Molzen Corbin has been tasked with the following scope:

- Identification of all connections to the City of Las Cruces sanitary sewer system along University Avenue.
- Provide Horizontal and vertical GIS coordinates of NMSU Sewer lines that are surveyed. These lines should be tied to the NMSU control system.
- Identify building sanitary sewer line connections to include the following buildings:
 - Conroy Honors Center
 - Music Building
 - o Chemistry Building
 - o Nason House
 - O'Laughlin House
 - o Gardiner Hall
 - o Dove Hall
 - Business Complex
 - Kent Hall
 - Health and Social Services
 - Health and Social Services Annex
 - o Guthrie Hall
 - English and Speech Halls
 - Dan Williams Hall and Annex
 - Barnes and Noble
 - Rhodes Garrett Hamiel Hall
 - o Monagle Hall
 - Delta Zeta Sorority
 - o Zeta Tau Alpha Sorority
 - o Chi Omega Sorority
 - o Garcia Hall
 - Piñon Hall

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- Evaluate all data to verify if any storm water is entering the sanitary sewer system and the point of origin.
- Video taping of building sewer lines and NMSU Sewer mains along University Avenue to validate sewer line routes and condition. In addition, abandoned sewer services will be identified, if any.
- Update NMSU's sewer system map to include the information identified. These services can be used as a starting point for a Sewer Master Plan with respect to existing facilities, which does not include flow modeling or sewer line interceptor projections.



4.0 AGENCY COORDINATION

Various meetings were held between NMSU, Molzen Corbin, the City of Las Cruces, Tierra Surveys, and Southwest Envirotec to ensure that various points were covered and that everyone knew the status of the project.

4.1. August 21, 2014 – Kickoff Meeting

A kickoff meeting was held on Thursday August 21, 2014 where members of Molzen Corbin, Tierra Surveys, NMSU, and the City were present. A smoke test to determine storm water infiltration was discussed. Topics included:

- Dry floor drains would need to be filled with water to keep smoke from entering the buildings.
- What is the composition of the smoke used in the smoke test?
- It is possible that smoke could come from odd places including the walls.
- The NMSU fire department may need to coordinate with alarm technicians.
- A plan of action should be developed 3 weeks before the smoke test start date itemizing NMSU support.
- Metered and unmetered flow should be identified.
- The NMSU police department should possibly be dispatched and a campus wide notification may be needed.
- The smoke test should tentatively be done the week of September 22.
- The smoke test should be done for buildings during hours where peak flows are not being generated.

4.2. September 12, 2014- Building Monitor's Q&A Meeting

Representatives of Molzen Corbin and NMSU were present to describe to the building monitors the purpose of the smoke test and discuss necessary protocols for the week of September 22. Issues with the proposed schedule of the smoke test were discussed



and possible solutions were proposed. The Material Safety Data Sheet for the smoke product was also discussed.

4.3. September 18, 2014- Final Smoke Test Coordination Meeting

Representatives of Molzen Corbin, NMSU, and Southwest Envirotec were present to discuss the final coordination efforts in advance, as the smoke test was scheduled to begin on September 23. Issues with the schedule were discussed, along with support that NMSU could provide during the smoke test.

4.4. October 1, 2014- Sewer Mapping Coordination Meeting

Molzen Corbin, NMSU and Southwest Envirotec met to review the Molzen Corbin Plan of Action. It was determined that NMSU would clean the sanitary sewer lines ahead of the Southwest Envirotec crew televising the lines. Inspection would commence at Piñon Hall and proceed downstream. NMSU would also provide help with access to manholes and cleanouts as needed.

4.5. November 25, 2014- Sewer Mapping Progress Meeting

Molzen Corbin and Southwest Envirotec met to discuss sanitary sewer lines that may not have been televised, and which ones may have given the Southwest Envirotec crew problems. A checklist was developed by Molzen Corbin for Southwest Envirotec involving sanitary sewer lines to be televised.



5.0 SMOKE TEST EVALUATION

A smoke test was performed by Southwest Envirotec staff in conjunction with NMSU and Molzen Corbin staff to determine if any storm sewer connections or storm water infiltration into sanitary sewer lines exist at the NMSU buildings adjacent to University Avenue, north of the International Mall. A smoke test is done by isolating known service lines to a building with plugs, before using the smoke machine to blow smoke through a manhole up the service lines. Sanitary sewer manholes near each building were utilized to plug lines that carry wastewater either downstream, or upstream of the building. The lines were plugged for no more than 20 minutes, while a smoke machine was placed over open manhole to blow smoke through the service lines to the building. Lines with heavy flow had to be tested during times when plugging the line was feasible. Smoke would appear anywhere there was a connection to the sewer line that had an opening to the atmosphere. If there was storm water infiltration into any of these lines, smoke would rise from infiltration points such as drop inlets, roof drains, etc. During a smoke test without any cracks or cross connections, smoke would be seen only from the sewer vents on the roof of the building. NMSU personnel were on the roof for each of the smoke tests besides the center for the arts as well as the honors college to observe if smoke was exiting from roof drains or sewer vents.

A smoke test schedule was developed based on the 2013 NMSU sewer map. This schedule showed dates and times of each test along with an approximate number plugs to be used. The schedule designated which lines would be plugged and which manholes would be utilized along with which buildings could be tested from the individual smoke test. Table 5.1 shows the smoke test schedule that was followed.

The 2013 NMSU sewer map shows approximate locations of sewer lines with sizes and lengths along with numbers for each manhole. This map was helpful when determining the smoke test schedule. The 2013 NMSU sewer map is shown in Figures 5.1.1 and 5.1.2. The map was modified to show colors for different manholes to be tested based on the smoke test schedule. Minor adjustments were made based on prior knowledge before going out into the field. This map shows the main lines and not the services, making it difficult to determine exactly which buildings would be smoke tested during



each smoke test. Some issues were found on this map, and were updated as part of this project.

The schedule was based on a number of factors including building location, peak flow, building monitor preference, as well as the event schedule for the building. Each building was notified in advance that a smoke test would take place and flyers were posted on each building with the smoke test schedule. Molzen Corbin and NMSU staff worked hard to create the best possible schedule to avoid as many potential issues as possible.

Smoke Tests							
Date	Time	Plugs Needed	MH Smoke	MH Plugs	Buildings		
23-Sep	6AM	1-8"	Z	177CE	Center for the Arts, Conroy Honors Center A		
23-Sep	7AM	3-8"	163A	163S, 163E, 163B E	Music Building A, Conroy Honors Center A		
23-Sep	8AM	1-4"	165	165 S	Nason House, O Laughlin House, Chemistry C		
23-Sep	1PM	1-6"	140	140 S	Delta Zeta, Zeta Tau Alpha, Chi Omega		
23-Sep	2PM	2-6"	143	143 S, 143 E	RGH.		
24-Sep	6AM	4-8"	160	163A S, 160 E, 163 S, 163 E	Chemistry B, Music B		
24-Sep	7AM	2-4"	161	166 S, 159 W	Chemistry A, Gardiner A		
24-Sep	8AM	1-8", 1-4"	156	155W, 160 E	Gardiner B, Dove		
24-Sep	9AM	3-6"	143	143 S, 143 N, 140 S	Monagle		
24-Sep	10AM	1-6"	Lift Station	126E	Monagle		
24-Sep	1PM	4-6"	128	128 S, 128 W, 129 S, 129 E	Garcia		
24-Sep	2PM	2-6"	130	129 E, 131 W	Piñon		
25-Sep	6AM	4-4"	148	148 W, 157A W, 147 S, 148C N	Health and Social Services A, Dan Williams A		
25-Sep	7AM	3-4"	157	159 E, 157 E, 148 W	Kent Hall, Business Complex		
26-Sep	6AM	1-4"	148E	148D N	Barnes and Noble		
26-Sep	7AM	2-4"	Y	Y S, Y W	Health and Social Services B, Clara B Williams Hall, Speech Hall, HSS Annex		
26-Sep	8AM	4-4"	Y	Y S, Y E, 153 S, 155 S	Guthrie		
Buildings- A, B, or C means that the building will be tested in different parts due to nature of services							
MH Plugs-S,W, N, E refers to direction within manhole							
MH Plugs- Manholes Y and Z are not numbered on the maps, but are believed to exist							
Manholes	143 and	V are tested twice	If time allows	go ahead and perform both tests on th	he manhole instead of waiting for the next day		

TABLE 5.1. SMOKE TESTS



FIGURE 5.1. NMSU 2013 SANITARY SEWER MAP (WEST) AND SMOKE TEST SCHEDULE





FIGURE 5.2. NMSU 2013 SANITARY SEWER MAP (EAST) AND SMOKE TEST SCHEDULE



NMSU Main Campus Sewer System Identification Final Report of Findings



5.1. Smoke Test Observations

5.1.1. September 23, 2014

NMSU, Molzen Corbin, and Southwest Envirotec staff met at 5:30 AM between the Center for the Arts and Conroy Honors Center. Smoke testing didn't begin until 6:20 AM due to the absence of sunlight. The smoke test did not have billowing smoke as predicted which made it difficult to see with the overcast skies. There were approximately 12 NMSU employees along with 3 from Molzen Corbin, and 2 from Southwest Envirotec. Manhole Z on the map was not originally on the map, but was known to exist. Therefore, it was added to the map for the smoke test; however, manhole Z was not found. Therefore, the manhole in the parking lot on the west side of Espina Street was utilized for the smoke test. Smoke was seen in a downstairs bathroom in the arts building which came from a dry P trap. The smoke dissipated quickly. Smoke was also seen from the sewer vents on the rooftops of both the Arts building as well as Conroy Honors Center. No storm water infiltration points were found.

The second smoke test was completed by utilizing the manhole in the grass on the north side of the horseshoe on the southwest side of the Music Building. The initial manhole to be tested was not found as it does not exist. This manhole had heavy flow once the plug was removed. The other manhole that was plugged on the northwest corner of the Music Building did not appear to have any flow. This manhole had a lot of dirt infiltration into the manhole. Smoke was seen from the Music Building sewer vent on the southwest side of the building. It should be noted that the line entering the manhole parallel to the horseshoe was a 6" and not an 8". This was the line that was plugged. No storm water infiltration points were found.

The third smoke test had to be moved to 11 AM to allow for the manhole to be pumped out as it appeared to have a clog somewhere in the downstream line that flowed to the manhole with dirt infiltration. The line flowing in the southwest direction appeared to have a clog as well as a shallow slope. Smoke came out of the vents including a fire place within the Nason House. Smoke came out of a door frame where there was a crack and then that smoke went through the fireplace and out through the chimney. It is



believed that there is a crack in a pipe somewhere in the wall or perhaps the sewer vent. Smoke was also seen from the O'laughlin House roof sewer vents. No storm water infiltration points were found.

The fourth smoke test was done on the east side of Rhodes Garrett Hamiel (RGH) at 1 PM. The downstream line was plugged within the manhole. The smoke was easy to see coming out of the sewer vents of two of the sorority houses including Delta Zeta and Tau Alpha. Though it was hard to discern, smoke was seen from the third sorority house, Chi Omega, on the east side of Locust. No storm water infiltration points were found.

The fifth smoke test was done in the bike lane between RGH and Monagle Hall in close proximity to where the bike lane meets Jordan Street. This manhole contains 4 inlets and 1 outlet. The existing sewer map only shows two of the inlets. It is believed to receive two lines from two of the patios from Monagle Hall. The other two lines supposedly come from RGH and the sorority houses. Smoke could be seen coming out of the roof vents as well as a bathroom near the game room on the northwest corner of RGH. The smoke in this bathroom came out what appeared to be an air vent which could mean that there is a possible crack in the line. No storm water infiltration points were found.

5.1.2. September 24, 2014

NMSU, Molzen Corbin, and Southwest Envirotec staff met at 5:30AM to begin the smoke test. The first smoke test did not commence until approximately 6:15 AM as alarms weren't shut off until then. The first smoke test on this day was done at the manhole on the south side of the Chemistry Building. There were two manholes on the southeast side of the Chemistry Building as shown on the 2013 NMSU sewer map. The manhole closer in proximity to the sidewalk was considered to be the one receiving flows from the east while the manhole in the grass was considered to receive flows from just the Chemistry Building. The manhole southwest of the music building was plugged on the upstream side in an effort to isolate smoke to just the Chemistry and Music Buildings. Smoke was observed by NMSU and Molzen Corbin staff to be coming from



cleanouts, sewer vents, and 2 neautralizing basins adjacent to the chemistry building. Staff also observed smoke at upstream manholes near Gardiner and Dove Halls, indicating that the line that was assumed to go north to a manhole next to the Chemistry Building did go that way, but it did not end there and instead received flows from the east. No storm water infiltration points were found.

The second smoke test was scheduled to be on the north east side of the chemistry Building. However, that manhole was inaccessible due to its depth as well as a sanitary crossing approximately 5 feet below the rim. The crossing didn't allow enough room for a person to get into the manhole, and the depth would require a person to be lowered to the invert with a tripod and oxygen may need to be supplied. The downstream manhole that was expected be plugged was observed to be at the centerline of University Avenue and not on the south side of University Avenue as shown on the 2013 sewer map. If a man was capable of being lowered into the manhole near the chemistry building for plugging, coordination with the City would be needed for access to the downstream manhole. Therefore this smoke test was not completed, meaning connections from the south side of Gardiner Hall could not be tested. This line is believed to have a direct 8" connection to the City of Las Cruces sanitary sewer line below University Avenue based on the information received from the City.

The manhole near Kent Hall did not receive flows from Gardiner Hall, indicating that another form of testing may need to be pursued for Gardiner Hall such as a dye test or City coordinated smoke test. A smoke test or dye test may also be warranted on the south side of Gardiner Hall to check for services to the line that flows down towards the music building. This smoke test was unable to be done during the week of smoke testing because a service line is presumed to flow from Hadley Hall to the line between Gardiner and Chemistry halls without a manhole available for plugging purposes. Hadley Hall did not receive notice of the smoke test If a smoke test was to be done at Hadley, notice would need to be given in the event that smoke infiltrates the building. This test may need to be completed during weekend or holiday hours.

The manhole in front of Dove Hall was opened to perform a smoke test. This smoke test was not completed as it appears the service from Dove Hall ties into the service



from Guthrie Hall outside of the manhole based on flush tests. Dove Hall was postponed until the testing of Guthrie Hall.

The following smoke test was completed at the lift station near Monagle Hall. Bolts were removed from the cover to allow access to the lift station where plugs were not used. Smoke was blown into the manhole and smoke was observed at the sewer vents from the east patio. No smoke was seen from any roof drains. It should be noted that multiple cleanouts were missing plugs which could lead to minor infiltration.

Garcia Hall was supposed to be smoke tested; however, there was a large amount of flow in the manhole after lunch indicating that it could not be plugged due to a lack or storage in the line. Also, this manhole was deep enough to require air and a tripod to lower Southwest Envirotec personnel into the manhole. It should be noted that the line between Corbett Student Union and Monagle Hall was not correctly located on the existing map and a manhole was discovered to be covered by grass on the south side of Monagle Hall.

Piñon Hall was tested by utilizing the manholes north of the I-mall near Piñon Hall and Educational Services. These three manholes were not shown on the sanitary sewer map, but allowed for isolation of Piñon Hall without affecting the Educational Services building or the Pan American Center. Smoke was seen from the sewer vents but not from any of the roof drains. Smoke was seen from cleanouts on the north and east sides of Piñon Hall. The existing cleanouts on the east side of the building need clean out plugs, as it appeared that smoke was coming from areas adjacent to the building through the grass. A change will be made to the map to reflect the manholes found.

A smoke test was performed at Monagle Hall, four 6" plugs were used. Three lines were smoked towards Monagle Hall while the lines towards RGH or downstream were plugged. This resulted in smoke coming from a cleanout on the west side of Monagle Hall as well as some sewer vents on the south side of Monagle hall within the far west patio. NMSU employees on the roof did not see any smoke.



5.1.3. September 25, 2014

Representatives from NMSU, Molzen Corbin, and Southwest Envirotec met at 5:15 AM for the test at the Dan Williams Art Building. It was determined that this would not test HSS as one of the NMSU facilities staff had knowledge that the HSS building only connected on the south side of the building and not the north. The first test was done on the east side of HSS as the HSS building attendants requested an early test time due to food vendors within the building. This test resulted in smoke from the sewer vents on the roof of the HSS building. It also resulted in smoke in the 2nd floor men's bathroom due to a dry P trap. It should be noted that connections from HSS building on the north side were not found during smoke testing.

The second smoke test was done at the Dan Williams Art Building on the southwest side by plugging the line upstream coming from Barnes and Noble. This test resulted in smoke from the sewer vents on the north side of the building. No storm water infiltration points were found.

The third test was done on the Dan Williams Art Building as the Art Building was forecasted to have 3 possible connections to the NMSU sanitary sewer system. Smoke was seen coming from the sewer vents.

The fourth test was done in close proximity to Kent Hall. This tested Kent Hall, the Business Complex, and the Art building. Smoke was seen on the roof of these buildings coming from sewer vents. Smoke was also seen coming from a crack in the parking lot east of Kent Hall and west of the Dan Williams Art Building which turned out to be a cleanout after investigation. No storm water infiltration points were found.

The fifth test was done at a manhole on the south side of Dove Hall west of Guthrie Hall. This test was supposed to test Dove and Guthrie Halls. Smoke was seen coming from the West side of Guthrie Hall. No storm water infiltration points were found.

The sixth test was done on the south side of Guthrie hall. This manhole included an abandoned line from Hardman Hall which was plugged for the duration of the smoke



test. Smoke was seen coming from the east side of Guthrie Hall through the sewer vents. No storm water infiltration points were found.

5.1.4. September 26, 2014

Smoke testing of the Barnes and Noble bookstore commenced at 5:30 AM. The first smoke test resulted in smoke filling up a room near the grease trap on the south side of the bookstore which resulted in the fire alarms coming on. The conclusion was that the P traps were dry which allowed for smoke to get into the rooms. The second smoke test was done after the alarms were shut off. NMSU employees on the roof did not see smoke coming from any roof drains. Smoke was only seen from sewer vents and not from roof drains. Drop inlets were spotted on the east side of Barnes and Noble which were believed to day light in a grass pond on the west side of the bookstore. No smoke was seen coming from any of these inlets or the pond.

The crew then moved to the south side of Garcia Hall to begin a smoke test that was skipped earlier in the week due to higher flows. This manhole is deep and receives flows from the East, North and the South. Flows from the south are believed to be from the American Indian Student Center. This manhole had a generous amount of flow at 6:30 AM which was less than the previous days but more than expected. Due to large amount of flow and required set up time due to manhole depth, the smoke test was not conducted.



6.0 TELEVISION OF TESTED SEWER LINES

The next phase of the project following smoke testing was verifying sewer line locations and updating the NMSU sewer map for the buildings that were smoke tested. Molzen Corbin used Southwest Envirotec to televise the sewer lines, and Tierra Surveys to survey the sewer lines.

NMSU staff was instructed to clean the sewer lines ahead of the Southwest Envirotec crew by water jetting all of the lines smoke tested, including the services by utilizing cleanouts. NMSU staff began cleaning the sanitary sewer lines and then Southwest Envirotec followed with their camera inspection.

Southwest Envirotec started at the upstream end of the project area at Piñon Hall. The Southwest Envirotec began by locating cleanouts and manholes to televise the service lines. The crew notice any turns or connecting services on a laptop display while the camera was moving through the line. The crew would then locate that point above ground with a detection device and use paint to mark the location. They would mark the direction of flow as well as manhole invert depths to aid the surveyor. Southwest Envirotec proceeded to televise the lines for each of the buildings smoke tested. Sources of error included blockages, heavy flow, unclean lines, and unknown locations for cleanouts and manholes. The cleanouts and manholes were located as best as possible, but covered manholes and cleanouts were discovered. Therefore, it is possible that sewer lines could have been missed in this investigation.

As Southwest Envirotec was performing their work, Tierra Surveys conducted their survey of the televised lines. Once the survey was complete, it was sent to Molzen Corbin. Molzen Corbin then reviewed the work done by Southwest Envirotec and Tierra Surveys and prepared instructions for locations that may have been missed. Southwest Envirotec and Tierra Surveys would go back out to the site and televise and survey the missing service locations. Upon completion of the TV inspection and survey, Molzen Corbin utilized the data from Southwest Envirotec and Tierra Surveys to update the existing NMSU sewer map.



7.0 DYE TESTING

Several buildings contained uncertainties, such as Gardiner Hall, Dove Hall, Hadley Hall, the Speech Building, Conroy Honor's College, and the Chemistry Building. It was imperative to locate the services for these buildings to ensure whether they were sending flows through the unmetered manhole on the north east side of the Chemistry Building. In order to verify the service locations for these buildings, dye testing was performed on February 4, 2015 by Molzen Corbin, Southwest Envirotec, and NMSU staff.

7.1. Chemistry Building

The Chemistry building was tested to verify unmetered flow was not present. Dye tests showed that the northeast wing of the Chemistry Building sends flow to manhole 161 which sends unmetered flow to the City system. The service line above the invert of manhole 161 was also dye tested through cleanouts to verify the flow direction. This line was observed to enter manhole 161A which makes its way to a metered flow location. The south wing of the building was also dye tested to verify that the service did not discharge into manhole 161. The dye test confirmed that the service discharged into the trunk line adjacent to the horseshoe.

7.2. Gardiner Hall

Gardiner Hall was not smoke tested due to the unknown location of the services and the fact that Hadley Hall was not notified of smoke testing and was at risk to receive smoke from a Gardiner Hall smoke test. Dye testing at Gardiner Hall indicated that the building was serviced on the north end and flows enter manhole 161 which sends unmetered flow to the City system.

7.3. Hadley Hall

Hadley Hall was dye tested to verify the service location and ensure flows went through a metered flow location. Dye testing at Hadley Hall showed flows to discharge into manhole 160 before gravity flowing to the metered flow location.



7.4. Conroy Honor's College

The discharge location of Conroy Honor's College an unknown as a service line on the south side of the building exists. Dye testing proved that the service line on the south side of the building was dead and that the service was on the west side of the building. Flows discharge into manhole 177C on the northeast side of Skeen Hall before flowing to a metered flow location.

7.5. Speech Building

The Southwest Envirotec crew was unable to televise the service for the Speech Building due to a blockage. A dye test was used to verify the service was on the south side of the building and not the north side. The dye test confirmed a south service line.

7.6. Dove Hall

During both smoke testing and the televising of the lines, the services for Dove Hall were unable to be located. A dye test was performed in order to locate the service. A dye test showed that the service line connected to the trunk line just upstream of manhole 156 and does not go through manhole 161. Cleanouts for the service were unable to be located.



8.0 FINDINGS

There were three buildings where smoke test results were not obtained including Gardiner Hall, Dove Hall, and Garcia Hall. No points of storm water infiltration were noted at any of the other locations except for missing cleanout caps.

8.1. Uncertainties

8.1.1. Gardiner Hall

Gardiner Hall was not smoke tested because the service was found to be on the north side of the building and flowed into a manhole which flowed to University Avenue. This service could not be tested without plugging sanitary sewer lines located beneath University Avenue. The manhole on the northeast side of the Chemistry Building was too difficult to smoke test due to a crossing pipe above the invert and the manhole's depth. Coordination with the City of Las Cruces should be done to test this area to conclusively determine no storm water infiltration. It should be noted that staff in Gardiner Hall have reported sewer odors. Therefore, this area should be tested to locate leaks inside the building.

A drop inlet was discovered on the northeast side of Gardiner Hall, with an unknown outlet location. It appears that this drop inlet receives runoff from a small drainage area, yet the outlet should be located to verify that it is not tied to the sanitary sewer system.

8.1.2 Garcia Hall

Garcia Hall was unable to be tested due to the depth and flow of the manholes that needed to be used. These manholes contained a large amount of flow during morning and afternoon hours and were deep enough to require a tripod set up to lower a person down to the invert. This made it difficult to plug multiple lines and then perform the smoke test in a minimal amount of time for the sewer line not to backup under heavy flow conditions. If Garcia Hall were to be smoke tested, it should be done when the facility is vacant.



A drop inlet was noticed to exist inside the Garcia Hall patio. It is unknown where the drop inlet outlets, but it should be investigated to make sure it is not tied to the sanitary sewer system.

8.1.3. Dan W. Williams Hall

The existing 2013 NMSU sewer map showed a confusing array of services near Dan Williams Hall, making it difficult to smoke test the building. However, Dan Williams Hall was smoke tested through multiple tests at multiple manholes and then televised as accurately as possible. No points of storm water infiltration were found.

A manhole was also located on the east side near one of the two drop inlets found near the building. This manhole wasn't noticed during the smoke test as it wasn't shown on the existing sewer map. This manhole was believed to be a sanitary sewer manhole due to the manhole cover, but doesn't appear to contain any sanitary sewer services. This manhole appears to be plugged as it only contains dirt and mud.

Drop inlets were located on the east and northeast sides of the building, yet smoke was not seen at these drop inlets during the smoke test. One drop inlet wasn't noticed during the smoke test, and it is possible that the dumpster could have been covering it; however, smoke was not seen in the area when tested. The drop inlet on the north side of the building was determined to outlet at the bike path adjacent to University Avenue. The drop inlet on the east side of the building was investigated by Southwest Envirotec with their camera services and was determined to go underneath the building to the west and outlets at an unknown location. This may be something to investigate, but it is reasonable to conclude that it is not a sanitary cross connection and instead ties in to the nearby City storm sewer system.

8.2. Unmetered Flow Locations

The City of Las Cruces is interested in any unmetered flows entering the City system. This includes storm water infiltration into the system along with services which bypass metered locations and connect directly to the City system.



One location was observed to have a direct connection to the City system where the sanitary flows were not metered which was at manhole 161 just east of the Chemistry Building. Any flows into this manhole bypass the flow meter. Table 8.2.1 shows the buildings which discharge into manhole 161 which connects to the City system. Figure 8.2.1 shows the buildings which bypass the flow meter and connect directly to the City sanitary sewer system.

Building Name	Building No.
Chemistry Building	
(NE section)	187
Gardiner Hall	188
Kent Hall	133
Business Complex	386
Health and Social Services	590
Dan Williams Hall	60
Barnes and Noble	632

TABLE 8.2.1. BUILDINGS WITH UNMETERED FLOW







MOLZENCORBIN



9.0 CONCLUSIONS

Molzen Corbin was contracted by New Mexico State University (NMSU) to provide Sanitary Sewer Identification Services. NMSU wanted to identify all connections to the City of Las Cruces sanitary sewer system for accurate identification of flows that exit NMSU properties. Molzen Corbin with the help of Southwest Envirotec, Tierra Surveys, and NMSU staff; analyzed the sanitary sewer system through smoke testing, television inspection, and dye testing.

9.1. Stormwater Infiltration

All of the buildings smoke tested did not produce any results that would suggest ties to the sanitary sewer system. However, two buildings were not smoke tested and drop inlets were noticed in various locations with unknown outlet locations. Cleanouts with missing caps were also noticed.

We recommend that cleanouts for each of the buildings have caps replaced to eliminate storm water infiltration into the sanitary sewer system through cleanouts. NMSU is committed to installing water tight manhole covers, a process which they have already begun implementing. The storm sewer lines within the drop inlets at Gardiner Hall, Garcia Hall, and Dan W. Williams Hall should be further investigated. Though it is reasonable to assume that the outlet pipe for the drop inlet at Dan Williams Hall ties into the City storm sewer system, it should be verified.

Garcia Hall and Gardiner Hall were unable to be smoke tested. The drop inlet outlet pipes could be cleaned and then televised to locate the outlet or some sort other form of investigative tests could be done to determine where these pipes outlet or connect. Smoke testing Garcia Hall is recommended when school is not in session.

9.2. Unmetered Flow

Gardiner Hall, Kent Hall, the Business Complex, Health and Social Services, Dan Williams Hall, Barnes and Noble, and the northeast section of the Chemistry Building all



tie into the City system by bypassing the flow meter. NMSU's Center for the Arts currently has a direct connection to the City system, where the City receives payment for 65% of the water use for the building.

There are several solutions for this problem. One solution would be for NMSU to negotiate the same deal they have for the Center for the Arts. This would result in NMSU paying the City for 65% of the water use at the seven buildings mentioned. Another solution would be to utilize a temporary flow meter at manhole 161, or within the downstream City manhole to monitor sanitary flows vs water use to determine a more accurate percentage. A third option would be to perform a fixture count at each of the buildings mentioned to determine the sanitary flows for payment to the City. It should be noted that just the northeast section of the Chemistry Building should be monitored for City billing, as the rest of the building goes through a flow meter downstream before discharging into the City system.

APPENDIX A

2013 NMSU Sewer Map





APPENDIX B

CLC University Ave. TV Reports




CITY OF LAS CRUCES TELEVISION INSPECTION

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COMMENTS: D-RIMS - Rubben from Joints (349'-372' DIP INLINE) 4464' COMMENTS: D-RIMS - Rubben from Joints COMMENTS: BACK 234' DYE TEST DONE At GLENN'S 369' 350' DIP INGINE		452'	445'								Dusis	"B"	
HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH HUGH	in a	D-RINS -	rs: Rubber	fio,	n i	Joint	S	(3	349'-	312',	DIPIN	(ine)	
COMMENTS: D'RING - Rubben from Joints COMMENTS: BACK 234' DYE TEST DONE AT GLENN'S 369' 350' DIP IN GINE COMMENTS:	3	466'											
COMMENTS: BACK 234' DYE TEST DONE AT GLENN'S 349'350' DIP INGINE		ORINS	- Rubbe	n fa	bom	Jon	its		1		1		2 2
COMMENTS: BACK 234' DYE TEST DONE AT GLENN'S 369'350' DIP IN GINE													
369' 350' DIP IN GINE		COMMEN BA	rs: cK a	34'	DYE	Test	Donie	<u> </u>	4 G	lenn!	5		
COMMENTS		369'3	50' DI	o inc	INE								
		COMMEN	IS:								an a		

SVC.=SERVICE CONNECTION SVC.WR=SERVICE CONN. W/ ROOTS CRK.HLC=HAIRLINE CRACK CRK.RDL=RADIAL CRACK

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SHFT.JNT=SHIFTED OR DROPPED JOINT BRK.JNT=BROKEN JOINT BRK.PIPE=BROKEN PIPE

	CITY OF LAS CRUCES TELEVISION INSPECTION REPORT	Pg7 West
DATE: 812196 LOCATION:	655 UNIVERSITY	CAMERA TECH: R.S.
PIPE SIZE: <u>A</u> I" I PIPE TYPE: <u>A</u> MH # MH DEPTH <u>14'5"</u> BEGIN TELEVISION INSPECTION A <u>C55</u> UNIVERSITY AV	<u>CON</u> TAPE # <u>K-2</u> <u>32</u> dir of flow UPSMH <u></u>	MIN <u>40</u> SECONDS DWNSMH <u>YES</u> <u>DET.</u> Y N
COMMENTS: THIS SECTION FULL OF WATER	MH# V. 1000934 $H_{457}$ FT. of Pipe $3/4$	L PRE-REHAB M POST-REHAB H REVERSE
FOOTAG CLOCK SVC SVC READING POSITION CON WR 299.8 3:00 X	LINE ROOTS CRK CRK DIP HLC RDL	SHFT BRK BRK JNT JNT PIPE
DYE 425 UNIVERSITY 302' 3:00 X COMMENTS: NOT IN USE	(CASE MEIA)	
386' 2:00 × Comments:		
443.4 3:00 × COMMENTS:	University	
SVC = SERVICE CONNECTION	SHFT.JNT=SHIFTED C	DR DROPPED JOINT

BRK. PIPE=BROKEN PIPE

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SVC.WR=SERVICE CONN. W/ ROOTS CRK.HLC=HAIRLINE CRACK CRK.RDL=RADIAL CRACK

CITY OF LAS CRUCES TELEVISION INSPECTION REPORT Section & B3 Was
DATE: 8 1/9196 LOCATION: 545 UNIVERSITY AV. CAMERA TECH: R.S.
PIPE SIZE: $21^{"}$ I PIPE TYPE: $Con$ TAPE # $K-3$ 19 MIN 02 SECONDS
$MH # \ MH DEPTH 14'3'' UPSMH> DWNSMH YES$
BEGIN TELEVISION INSPECTION AT MH#       1000934       DET.         545 UNIVERSITY AU.       1000934       DET.         END TELEVISION INSPECTION AT MH#       1000897       L         UNIVERSITY AU.       EVALUATION AT MH#       1000897         UNIVERSITY AU.       EVALUATION AT MH#         UNIVERSITY AU.       EVALUAT
JOB # EVALUATION M POST-REHAB
COMMENTS: Stant Seeing ORing At Tar. H to 281. Ft. REVERSE SET-UP
FOOTAG CLOCK SVC SVC LINE ROOTS CRK CRK SHFT BRK BRK READING POSITION CON WR DIP HLC RDL JNT JNT PIPE
128.4
COMMENTS: O. Ring top of Pipe
140' 11 11
COMMENTS:
150. 155 199.3 201.7
COMMENTS: /
235. 12:00 ×
COMMENTS Plused
2R3' MH.
AT TURRENTING / UNIVERSITY
SVC.=SERVICE CONNECTION SHFT.JNT=SHIFTED OR DROPPED JOINT

BRK.PIPE=BROKEN PIPE

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SVC.WR=SERVICE CONN. W/ ROOTS CRK.HLC=HAIRLINE CRACK CRK.RDL=RADIAL CRACK

**CITY OF LAS CRUCES** TELEVISION INSPECTION SECTION: 9 R9 WB REPORT DATE: 8119196 LOCATION: WILDUSILY /TURRENTINE CAMERATECH: R.S. MIN 51 SECONDS PIPE SIZE: 21" I PIPE TYPE: CON TAPE # K-3 dir of flow ----> DWNSMH YES BEGIN TELEVISION INSPECTION AT MH# Y N 100397 UNIVERSITY & TURRENTINE DET. END TELEVISION INSPECTION AT MH# **EVALUATION** 51006278 L Schoin HolidaL INN LENGTH_344 PRE-REHAB WEATHER Good JOB # EVALBATION M POST-REHAB COMMENTS: START SEEIN O-RING AT 28' Н REVERSE to 242' SET-UP CRK BRK BRK CRK SHFT LINE ROOTS SVC CLOCK SVC FOOTAG PIPE RDL JNT JNT READING POSITION CON WR/ DIP HLC 29' COMMENTS: 246 338 Victores on PALE COMMENTS: ALAY Sec PIDE FROM nN. 346' MH COMMENTS: SIDE of SILMA EAST COMMENTS: COMMENTS: SHFT.JNT=SHIFTED OR DROPPED JOINT

SVC.=SERVICE CONNECTION SVC.WR=SERVICE CONN. W/ ROOTS CRK.HLC=HAIRLINE CRACK CRK.RDL=RADIAL CRACK

### SHFT.JNT=SHIFTED OR DROPPED JOINT BRK.JNT=BRØKEN JØINT BRK.PIPE=BRØKEN PIPE

CITY OF LAS CRUCES TELEVISION INSPECTION REPORT Section - 9 B10 WE
DATE: 8 120196 LOCATION: HOLIDAY INN SIPHON CAMERATECH: R.S.
PIPE SIZE: 12" I PIPE TYPE: CLA- TAPE # K-3 7 MIN 7 SECONDS
MH #MH DEPTH /4 '6'' UPSMH       UPSMH       DWNSMH YES         BEGIN TELEVISION INSPECTION AT MH#       Y N         HOCICIAY INN Siphon       Siphon       Y N         END TELEVISION INSPECTION AT MH#       1006278 DET.       EVALUATION         WEATHERGoodLENGTH/8FT.       Image: Clay Pipe Looks Good       Image: Clay Pipe Looks Good         COMMENTS:       CLAY Pipe Looks Good       H       POST-REHAB
-OOTAG       CLOCK       SVC       SVC       LINE       ROOTS       CRK       CRK       SHFT       BRK       BRK         READING       POSITION       CON       WR       DIP       HLC       RDL       JNT       JNT       PIPE
COMMENTS:
COMMENTS:
COMMENTS:
COMMENTS:

SVC.=SERVICE CONNECTION SVC.WR=SERVICE CONN. W/ ROOTS CRK.HLC=HAIRLINE CRACK CRK.RDL=RADIAL CRACK

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SHFT.JNT=SHIFTED OR DROPPED JOINT BRK.JNT=BROKEN JOINT BRK.PIPE=BROKEN PIPE

	MANHOL	E DATA CAR	ע		
STREET LOCATION:	1815 Universit South-side 1	ly Avenu	<u>e</u>		
Employee Unit No.:_	860 Time	9:00	(a.m.)/p.m.	Date:	9-19-97
Book No.: 13	Page N	D.: 173	1	Line No.:	1001916
Installation Date of	of Manhole: <u>+ 15</u>		· · · ·	01-0	1-1982



PTPE NO	PTPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
	800	12inch	7.1	Clay	IN	
	2100	Rinch	7.2	Clay	OUT	i shi t
	~80			l		
					-	
4					2	
6						BODK= 13
				a		P. 2. 172
8	-		1	L	L	- igen

MANHOLE DATA CARD

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STREET LOCATION: 1425 University Avenue North-side have Employee Unit No.: 860 Time: 8:00 (a.m.)/p.m. Date: 9-19-97 Book No.: 13 Page No.: 207 Line No.: 1001771 Installation Date of Manhole: <u>+14</u> OI-01-1983 IN OUT or an 1091

		DTDE STZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
PIPE NO.	PIPE DEGREE	FILE DIED		Clau	TN	and the second se
1	90°	12inch	5.5 "	Clay	-1-14	1.12 P-1010
	270°	12inch	5.6	Clay	OUT	
2		1.4		le children in the	ter i ser seg	
3						
ana ana' a	1					
4	1				-	
5						
6					All and the	Book=1
-						
						1 Pg = 20
8						$\bigcirc$

# MANHOLE DATA CARD

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STREET LOCATION: 1345 University Avenue North-side Lane Employee Unit No.: 860 Time: 10:00 (a.m./p.m. Date: 9-19-97 Book No.: 13 Page No.: 208 Line No.: 1001668 01-01-1983 Installation Date of Manhole: <u>+14</u> T JUT 000 002 191 1

TPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
1	90°	12inch	6.16	Clay	IN	
2	270°	12inch	6.3	Clay	OUT	
3	K yer - tric	1	an analas de an compositor	an marina panganan sa	n Constantin	
4		· · · · · · · · · · · ·		a an		
5		Contraction of the state of the				Barris Constanting of the State
6	78-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1		a la station de		······································	Books
7						Praz
8						3

CITE OL THE CRACER CONTECTION PICTURE MANHOLE DATA CARD

STREET LOCATION: Solano Drive & University Avenue West-side of Intensection Size Employee Unit No.: 860 Time: 11.00 (a.m./p.m. Date: 9-19-94 Book No.: 13 Page No.: 209 Line No.: 1001567 Installation Date of Manhole: <u>+14</u> Ol-01-1983 20 I N 000 gh, à 1.091 INSTRUCTIONS: Draw and number all main lines that exist from north clockwise. Show direction of flow and indicate if drop manhole.

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PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
1	90°	Izinch	8.0	Clay	IN	
- <u>-</u>	780°	binch	7.46	Clay	IN	
3	<b>2</b> 70°	Izinch	8.06	Clay	OUT	
4			<ul> <li>A set of the set of</li></ul>	na an a		
5			and the second second	ngentras caración y la del		
6			(), () () () () () () () () () () () () ()	ner er som hand		
7			1.111-4-12-14条约2 			BOOK=1
8						Pg= 2.0

STREET LOCATION: $UNIVERSI \downarrow e' Alley$ Center Unive Employee Unit No.: BS1 Time: a.m)/p.m. Date: 4/10/02 Book No.: IS Page No.: 208 Manhole No.: 100/482 Installation Date of Manhole: 420 Ol-Ol-1982 Flow from: UNIVERSITY & SolAND Flow to 25 Reference to 25	CITY OF LAS CRUCES COLLECTION SYSTEM	
STREET LOCATION: $UNIVERSI fy e' Alley Center UINE Employee Unit No.: BS1 Time: a.m/p.m. Date: 4/10/02 Book No.: 15 Page No.: 208 Manhole No.: 1001482 Installation Date of Manhole: 420 OI-01-1982 The set of the $	MANHOLE DATA CARD	
Employee Unit No.: <u>851</u> Time: <u>a.m./p.m.</u> Date: <u>4/10/02</u> Book No.: <u>15</u> Page No.: <u>208</u> Manhole No.: <u>160/H82</u> Installation Date of Manhole: <u>420</u> OI-01-1982 Flow from: UNIVERSITY $\xi$ SolAND Flow for est W- Soland Flow for est MH IN Ref. 1 051	STREET LOCATION: UNIVERSILY & ALLEY CENTER LINE	
Book No.: <u>15</u> Page No.: <u>208</u> Manhole No.: <u>1001482</u> Installation Date of Manhole: <u>420</u> <u>01-01-1982</u> Flow from: 340 <u>1</u> $30$ <u>5</u> 740 <u>1</u> $30$ <u>5</u> 740 <u>1</u> $30$ <u>5</u> 740 <u>1</u> $30$ <u>5</u> 750 <u>6</u> 750 <u>750</u> <del>5</del> 750 <del>600</del> <del>1</del> $950$ <del>50</del> 1000 <del>100</del> <del>1000 <del>100</del> <del>1000 <del>100</del> <del>100</del> <del>100</del> <del>1000 <del>100</del> <del>100</del> <del>100</del> <del>1000 <del>100</del> <del>1000 <del>1000</del> <del>1000 <del>1000</del> <del>1000 <del>1000</del> <del>1000 <del>1000</del> <del>1000 <del>1000</del> <del>1000 <del>1000 <del>1000</del> <del>1000 <del>1000 <del>10000 1000 <del>10000000000</del></del></del></del></del></del></del></del></del></del></del></del></del></del></del>	Employee Unit No.: 851 Time:a.m/p.m. Date: 4//	10/02
Installation Date of Manhole: $\frac{420}{1}$ $\frac{01-01-1982}{1}$ $\frac{100}{1}$ $\frac{100}{1}$ $$	Book No.: 15 Page No.: 208 Manhole No.: 100	1482
HILIN CHELL 1 19	Installation Date of Manhole: +20 01-01-1982	
1-Rout of	$\frac{340}{320}$ $\frac{340}{320}$ $\frac{340}{50}$ $\frac{320}{50}$ $\frac$	from: 25ity ¢ 10

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PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
1	400	124	5,40	VC	IN	
2	2400	12"	6,15	VC	out	
3				*		
4		8 52 8 10		.*		
5						
6					o *	
7						Book = 15
8						Pa = 20

### CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD

STREET I	OCATION:	UNIVE	RSITY			
	/	N FRO	nt of	KINKO'S		U.
Employee	Unit No.:	351 1	'ime:	(a.m./p.m.	Date:	1/10/02
Book No.	:15	Pag	re No.:	D9 Mank	ole No.:	1001407
Installa	tion Date of M	anhole:	+20	)	01-01-	1982
	Flow + E/s of e Espin	o MH on University, UA 32 8 8 7 7 7 7 7 7 7 7 7 7 7	sto N sto I	Po 30 50 50 50 60 60 60 FLI	\$0 E 100	Flow from proiversity é ALLEY
INSTRUCT	IONEI Drav an Cetton of flow	d number al and, indica	l main lines te if drop n	that exist from anhole.	om north	clockwise.
FIFE NO.	FIFE DEGREE	PIPE BIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
1	800	1211	5.48	VC	IN	
3	3000	12"	5.44	VC	out	

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Book=15 0 S

MANHOLE DATA CARD

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STREET LOCATION: Frand VNIVERST	
Center LINE	· ·
Employee Unit No.: <u>85</u> ] Time: A.M./D.M. Dat	. allalar
Book No.: 15 Page No 210	e. 410102
Installation Date of Manhole	No.: 1001488
	01-1982
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N .	
340 20	
320	
app 5	
-5	
8-14	
a the second sec	
	· · ·
Flow to MH of	Flow from
EAST SIDE SE ON	the University
le restrated to 1031	NMSU
S FLOW	
	51 St.

			<i>z</i>		
PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MATN
1600	811	16.05	1/0	INI	
24.00	811	16.20	VC	out	
				007	
					BOOKZ
	PIPE DEGREE $160^{\circ}$ $240^{\circ}$	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PIPE DEGREEPIPE SIZEPIPE DEPTH $160^{\circ}$ $8^{\circ}$ $16.05$ $240^{\circ}$ $8^{\circ}$ $16.20$ $240^{\circ}$ $8^{\circ}$ $16.20$	PIPE DEGREEPIPE SIZEPIPE DEPTHPIPE MATERIAL $160^{\circ}$ $3^{\circ}$ $16.05$ $VC$ $240^{\circ}$ $3^{\circ}$ $16.20$ $VC$	PIPE DEGREEPIPE SIZEPIPE DEPTHPIPE MATERIALIN/OUT $160^{\circ}$ $8^{11}$ $16.05$ $VC$ $IN$ $240^{\circ}$ $8^{11}$ $16.20$ $VC$ $out$ $IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII$

CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD UNIVERSIT LSDINA STREET LOCATION: INTALSECTION -Nonter LINIE North or Employee Unit No.:_____85[ a.m.)/p.m. Date: _____/10, Time: Book No.: 15 Page No.: 211 Manhole No.: 1001315 Installation Date of Manhole: 420 01-01-1982 FLOW FROM: 1201 UNIVERSITY 5 Flow to MH on constside 000 of UNIVERSITY a 191 & MESA

PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
1	200	911	2,05	VC	IN	
2	1400	Oil	2,10	VC	out	
3						
4						
5						· · · · · · · · · · · · · · · · · · ·
6						
7		,				Book= 15
	n gan sata yan na kanan kanan kawa na ya kata y 1	anna ann ann maraite 1923		R		Pa 2211

## CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD

Cover Siz inch inch inch inch inch	STREET LOCATION: <u>UNIVERSITY</u> <u>E' ESPINA</u> <u>EAST SIDE OF INTERSECTION - Centen LINE</u> Employee Unit No.: <u>351</u> Time: <u>a.m. p.m. Date: <u>4/10/02</u> Book No.: <u>15</u> Page No.: 212</u>
et A	Installation Date of Workel
t A	1200111111010 Date of Manhole:
	Flow freem NHA EAST of IN tensicition 240 1 30 ESPINA & S NUIVERSITY Flow to 245 UNIVERSITY Flow to 245 UNIVERSITY ESPINA ESPINA FLOW freem: NHA IN Freent of KINKOS Flow freem FLOW freem NHA IN Freent of KINKOS FLOW freem FLOW freem FLOW freem FLOW freem FLOW freem NHA IN FREENT OF KINKOS FLOW freem FLOW freem NHA IN FREENT OF KINKOS FLOW FREEM NHA IN FREENT OF KINKOS

PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
1	600	1211	5.65	VC	IN	
2	1200	gu	3.0	PVC	IN	YES
	2400	124	5.65	VC	out	
4	3400	011	5.34	VC	IN	
5		* 5 ₄ 1				- 2
6						
_7		•				Back 1
8						P= 21

CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD

ETREET LOCATION: UNIVERSITY / ESPENA Center of INtersuction Employee Unit No.: 851 No.: 15 Page No.: 213 Manhole No.: 1000562 Installation Date of Manhole: +20 01-01-1982

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00° 140°	1211	SI 70	PIPE MATERIAL	IN/OUT	DROP MAIN
90 940°	191	5,70	VC	(11)	
400	191			1 1 1 1	
- 5		510	110		
2		2,69	VC	out	
					Prokz

CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD M.H. Cover Siz 415 UNIVERSIT STREET LOCATION: 1. 23 inch 2. 24 inch 3. 25 inch Center LINE Employee Unit No.: 851 Time: a.m./p.m. Date: 4/ 1.H. Size · 3 feet Book No.: 15 Page No.: 214 Manhole No.: 1001246 4 feet 5 feet Installation Date of Manhole: +20 01-01-1982 Flow from ESPINA UNII les Flow FROM oh Oclor Contral 2 1091

PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
_1	600	15''	7.29	VC	IN	
2	226°	2"	3.0	PVC	IN	Yes
	3400	15"	8.30	VC	out	
4		×				Andrea - Frank - Frank
_5						
6			2			
7			1			Bookz
8						Raz

CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD STREET LOCATION: 855 UNIVERSITY CENTER LINE - West of KNOX Employee Unit No.: <u>851</u> Time: ______ a.m./p.m. Date: <u>4</u> Book No.: 15 Page No.: 302 Manhole No.: 100 Installation Date of Manhole: +20 0!-0!-198

Size



PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	
1	600	15"	7.0	VC	IN	VES
2	1000	15"	9.99	VC	ŤN	125
	2400	21"	10,51	VC	out	
4				VC	001	
5						
6			2			
7		•				Ro
8						<u>DU</u>

	CITY OF	LAS CRUCES CO MANHOLE DATA	LLECTION SY CARD	STEM	
STREET LOCAT	ION: 749 Center	UNIVERS	rity		
Employee Unit	t No.: 851	Time:	(a.m)	/p.m. Date:	4/11/02
Installation	Date of Manhole:	Page No.: f2	0	Manhole No	: <u>1001115</u> 01-1982
Flow to. EL PASCO/ UNIVERSITY	220 230 230 230 230 230 231 231	at i	20 15 10 15 091 ohi F	4 50 E 100 120 120 120 1200 1200 1200 1200	FLOW from 855 UNIVERSIT

PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
_1	80°	$\partial l''$	11.80	VC	IN	
2	2600	21"	11.80	VC	out	
3						
4						
5	*					
6						
_7	D.	•				Book: 15
8	10					Paz 303

	CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD
4. Cover Siz	ETREET LOCATION: UNIVERSITY/EL PAJED CENter of Entersection
size	Employee Unit No.: 851 Time: a.m./p.m. Date: 4/11/02
feet	BOOK NO.:         ID         Page No.:         304         Manhole No.:         1001027
eet A	Installation Date of Manhole: +20 01-01-1982
	Flow freque EL PASEO - MH Noreth of 240 N 30 UNIVERSITY 30 FLOW Freque R- K- FLOW for FLOW for S FLOW FLOW

PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
1	800	211	11.56	VC	TN	Yr-s
2	2460	2111	11,91	VC	out	
	3200	12"	6,50	VC	IN	YES
4						
_5			х. х			
6	a			-		
_7	8 1			· C. ·		Bookers
8	2					P= 304

CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD

STREET LOCATION:	455	UNIVERSIT	2
	CENT	FOR LINE	
Employee Unit No.:	851	_ Time:	a.m./p.m. Date: 4/11/02
Book No.: 15		Page No.: 305	Manhole No.: /000971
Installation Date of	Manhole:	+20	01-01-1982
			COLOCITIC THE DEVELOPMENT OF COLOCATION



PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
1	600	21"	14,55	VC	IN	
2	2400	21"	14.55	VC	out	
3						
4					-	
5						2
6						
		× 0				Book 15
8	10					Paz 305

## CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD

inch inch inch

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STREET LOCATION: 545 UNIVERSITY
Center LINE
Employee Unit No.: 851 Time: Q.m. /p.m. Date: 4/11/02
Book No.: 15 Page No.: 306 Manhole No.: 100093
Installation Date of Manhole: $\pm 20$ $01-01-1982$
HON N HON N HON N HON FROM: HON FROM: HON THE ST HON TH

PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MATN
_1	20°	21"	14:19	VC	1/41	
2	1000	15"	10.0	VC	IN	Yes
	2400	21"	1419	VC	out	HOW CUT
4	1	J				
_ 5						
6	50 J					
_7		•				D Vo IF
8						DOOK: 15
#### CITY OF LAS CRUCES COLLECTION SYSTEM MANHOLE DATA CARD

STREET LOCATION: UNIV	ERSILy /	TURRENTINE	
South side	of In	ster section	(center Line)
Employee Unit No.: 851	Time:	(.m./p.m.	Date: 4/11/02
Book No.: 15	Page No.:_	307 Nan	hole No.: 1000897
Installation Date of Manhole	:	+20	01-01-1982



**INSTRUCTIONS:** Draw and number all main lines that exist from north clockwise. Show direction of flow and indicate if drop manhole.

PIPE NO.	PIPE DEGREE	PIPE SIZE	PIPE DEPTH	PIPE MATERIAL	IN/OUT	DROP MAIN
1	600	21"	10.71	VC	IN	
2	2200	a''	10,80	VC	out	
3						
4						
5						
6				a di Briji R	1. C	
7		× *				Bookz 15
8				-		Pa = 30

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## **APPENDIX C**

### Liquismoke MSDS



#### MSDS AND TEST DATA EXPLANATION

Enclosed with this cover letter is a copy of our Material Safety Data Sheet and a Maxim Technologies report on the smoke generated by Hurco's LiquiSmoke.

Please note that only people who are using the "raw" LiquiSmoke will be concerned with the MSDS sheet. What is important on the MSDS sheet is Section III (Hazards Identification). Under "medical conditions", the National Toxicology Program (NTP), the Occupational Safety and Health Administration (OSHA), and the International Agency for Research on Cancer (IARC) all list **no medical conditions** for LiquiSmoke. IARC makes special note that there are **no carcinogenic dangers**.

We hired a private, nationally recognized laboratory, Maxim Technologies, Inc. of Sioux Falls, South Dakota, to sample the smoke generated by LiquiSmoke. The samples were sent to the Wisconsin Occupational Health Laboratory where a GC Solvent Scan was performed. Of the 107 items listed in a GC Solvent Scan, only .01 parts per million (PPM) petroleum distillates was found. The OSHA Permissible Exposure Limit (PEL) is 500 ppm. Carbon Monoxide and Carbon Dioxide levels all tested within the OSHA PEL. This information is important to persons being exposed to the "smoke". Even though these test don't identify any harmful quantities of toxic compounds, you will need to warn your customers of dangerous sewer gases that may be traveling with the smoke. They should always be warned to evacuate the premise when smoke is detected.

Finally, we had Maxim Technologies test the smoke generated by our LiquiSmoke for staining and residue. The tests showed that there was no staining or residue caused by LiquiSmoke. Your customers can rest assured that LiquiSmoke will not ruin their furniture or drapery.

If you have any questions or concerns about Hurco's LiquiSmoke, please give me a call at 1-800-888-1436.

Sincerely,

Lyndon J. Hurley President

### MATERIAL SAFETY DATA SHEET for HURCOGIES, INC.

#### LiquiSmokeTM

SECTION I Product Identification

TRADE NAME:

#### Hurco LiquiSmoke™

GENERAL OR GENERIC ID: DOT HAZARD CLASSIFICATION: CHEMICAL FORMULA: Hydrotreated Middle Distillate N/A

AL FORMULA: Proprietary This material is in compliance with the Toxic Substances Control Act (15 USC 2601—2629).

#### SECTION II Composition, Information on Ingredients

INGREDIENT:	
CAS #:	
PERCENT:	

Hydrotreated Middle Distillate 64742-46-7 100

#### EXPOSURE INFORMATION

IngredientsACGIH TLVSTELOSHA PelSTELHydrotreated Middle Distillate100 mg/m3NANAExposure limits expressed as 8-hour TWA concentrations in either parts<br/>per million (ppm), or milligrams per cubic meter (mg/m3).NANA

#### SECTION III Hazards Identification

#### ROUTES OF ENTRY

 Inhalation:
 Yes

 Skin:
 Yes

 Ingestion:
 Yes

 EXPOSURE EFFECTS

 Symptoms of Exposure:
 Headache, drowsiness, eye, respiratory or skin irritation, nausea, numbness.

 Acute Exposure Effects:
 Ingestion may cause nausea, vomiting and diarrhea.

 Chronic Exposure Effects:
 Dermatitis, pneumonitis & pulmonary

edema.

#### MEDICAL CONDITION

Aggravated by Exposure:	NA	
Carcinogen Status:	No	
NTP:	No	
OSHA	No	
IARC:	No	

**CARCINOGENICITY STMT:** According to IARC Monographs, severely Hydrotreated oils, such as this product, are not concidered carcinogenic. Nevertheless, good industrial hygienic practices are recommended.

#### SECTION IV First Aid Measures

#### Emergency and First Aid Procedures

Remove from contaminated atmosphere. Give artificial respiration if not breathing. Remove contaminated clothing. Thoroughly wash affected areas with soap and water. In case of eye contact, flush eyes with water for 10-15 minutes. **SEEK IMMEDIATE MEDICAL CARE.** 

If swallowed, DO NOT INDUCE VOMITING.



Flashpoint: Autoignition Temperature: LEL: UEL: Fire Fighting Procedures: Extinguishing Media: Unusual Fire & Explosion Hazard 265°f.(129.43°C) COC NA NA SCBA may be required. CO2, Dry Chemical, Foam

**Extinguishing Media:** CO2, Dry Chemical, Foam **Unusual Fire & Explosion Hazards:** Water may cause frothing.

#### SECTION VI Accidental Release Measures

#### SPILL/RELEASE INSTRUCTIONS

Eliminate all sources of ignition. Contain with earthen like or petroleum absorbent material. Remove with grounded suction pump to salvage container. Remove all contaminated materials.

#### SECTION VII Handling & Storage Information

Keep away from all ignition sources (e.g. heat, flame, sparks, strong oxidizers). Bond and ground container.

#### SECTION VIII Exposure Controls/Personal Protection

No

Engineering Controls: Local Exhaust: Mechanical Ventilation: Respiratory Protection:

Eye Protection: Glove Protection: Work/Hygienic Practices: To control vapors. For Confined Spaces. NIOSH approved organic vapor respirator. Chemical goggles or face shield. PVC/equivalent resistant glove. Always minimize body contact. Wash areas of body contact promptly. Use a PVC/equivalent resistant apron where splash potential exists.

#### SECTION IX Physical & Chemical Properties

Physical Appearance: Product Odor: Specific Gravity Solubility in Water Boiling Point Freezing Point (F): Melting Point (F): Vapor Pressure: Reference: Water white liquid Negligible <1 Insoluble 470°F 243.31°C NA 30°F -1.11°C <0.1 mmHg@70°F *Continued on back...* 

#### SECTION X Stability & Reactivity Information

Stability: Hazardous Polymerization: Materials to Avoid: Hazardous Decomposition: Stable Oxidizers Heat & Flame Carbon Monoxide and other petroleum decomposition products.

#### SECTION XI Disposal Consideration

Waste Management:

Per Federal, State and local laws.

#### SECTION IX Transportation Information

Proper Shipping Name:	
-----------------------	--

NOT A DOT REGULATED MATERIAL (Packaging in excess of 3500 gal require an OIL SPILL prevention and response plan per 49 CFR 1). NA NA

Hazard Class: UN/NA Number: Packaging Group:

All hazard precautions given in this data brochure must be observed. This brochure is for the unburnt LiquiSmoke Only. Test Data is available for LiquiSmoke

NA

"smoke" by contacting Hurco Technologies.

LAST ISSUE DATE: 01/10/04

Questions Concerning LiquiSmoke (8:00-5:00 Central Time) M-F Please Call: 1-800-888-1436

#### SECTION XIII Regulatory Information

Hazardous under SARA Section a311:	Yes
Fire Hazard:	No
Sudden Release:	No
Immediate:	No
Reactive Hazard:	No
Delayed:	Yes

SARA Section 313 Listed Components:

None

#### SECTION IX Other Information

NFPA 704M Rating

NFPA Fire Code:	1
NFPA Health Code:	1
NFPA Reactivity Code:	0
NFPA Other:	Blank

The information contained in this MSDS is believed to be accurate, but is not warranted to be, whether originated with Hurco Technologies or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to the circumstances.

#### NFPA Key

0 = Insignificant

- 1 = Slight
- 2 = Moderate
- 3 = High 4 = Extreme
  - Extreme

#### SECTION IX Definitions

**DOT =** Department of Transportation **CAS =** Chemical Abstract Service ACGIH = American Conf. Of Governmental Industrial Hygienists **OSHA =** Occupational Safety and Health Administration TLV = Threshold Limit Value STEL = Short Term Exposure Limit **PEL =** Permissible Exposure Limit **TWA** = Time Weighted Average **NTP** = National Toxicology Program IARC = International Agency for Research on Cancer LEL = Lower Explosion Limit **UEL** = Upper Explosion Limit **SCBA** = Self Contained Breathing Apparatus CFR = Code of Federal Regulations NFPA = National Fire Protection Agency EPA = Environmental Protection Agency

#### FOR ADDITIONAL NON-EMERGENCY MSDS INFORMATION CONTACT:



P.O. BOX 70, HARRISBURG, SD 57032 1-800-888-1436 Fax #: (605) 743-2465 E-mail: info@gethurco.com

## **APPENDIX D**

## Smoke Test Notification Letter



# SANITARY SEWER SYSTEM SMOKE TEST NOTIFICATION

23 – 26 September 2014 PD&E Project Manager: Leo Lucero

This building is part of project to evaluate and assess connections to the NMSU sanitary sewer system. An **odorless, non-toxic white smoke** will be introduced into the sanitary system and a team of "spotters" from Facilities and Services will be in the building to evaluate where the smoke rises. Our two primary objectives are to identify if any storm drain systems (rain gutters) are connected to the sanitary system (a code violation), and to validate our records of building(s) connectivity from point of smoke origin. We expect to see smoke rise from the roof tops of tested buildings, but it may also permeate from strange places – bathroom drains or wherever there is a break in the sanitary lines.

•	Tuesday	Wednesday	Thursday	Friday
Building	23-Sep	24-Sep	25-Sep	26-Sep
Center for the Arts	6AM			
Conroy Honors Center	6AM,7AM			
Music Building	7AM	6AM		
Chemistry Building	8AM	6AM,7AM		
Nason House	8AM			
O'Laughlin House	8AM			
Gardiner Hall		7AM,8AM		
Dove Hall		8AM		
Business Complex				7AM
Kent Hall				7AM
Health and Social Services			6AM, 7AM	
Guthrie Hall				8AM
HSS Annex			6AM,7AM	
English and Speech			7AM	
Williams Hall and Annex			7AM	
Barnes and Noble				6AM
Rhodes Garrett Hamiel Dorm	2PM			
Monagle Dorm		9AM,10AM		
Delta Zeta	1PM			
Zeta Tao Alpha	1PM			
Chi Omega	1PM			
Garcia Hall		1PM		
Piñon Dorm		2PM		

BE AWARE OF THE BUILDINGS BEING TESTED AND THEIR SCHEDULE.

### **STAY CALM** but **IF YOU SUSPECT A REAL EMERGENCY** is taking place, **DO NOT HESITATE TO CALL 9-1-1** (tell the operator your calling from NMSU)

If you see WHITE SMOKE during a test procedure, send an email to **luceroll.nmsu.edu** or call **646-5351** and leave a brief voice message. For all Smoke Test messages leave your building name, room number, and a description of smoke location (bathroom, duct vent, etc.)

## **APPENDIX E**

### Smoke Test Observation Notes

	Name	Jona	ah Ruybalid	Agency/Dept	Molzen Corbin	Phone #	575-52	22-0049	Dates:	9/23/2014	- 9/26/2014
			Smoke Tests		Smoke	Smoke Sighting (please indicate smoke sighting on m			<u>g on map</u> )		
#	Date	Time	MH Smoke	Building	gs Tested	Roof Sewer Vents	Roof Drain	Drop Inlet	Rain Gutter	Building	Other
1	23-Sep	6AM	Z	Center for the A Honors Center	Arts, Conroy A	х				x	
2	23-Sep	7AM	163A	Music Building A	A, Conroy B	x					
3	23-Sep	8AM	165	Nason House, ( House, Chemis	O Laughlin try A	x				x	
4	23-Sep	1PM	140	Delta Zeta, Zeta Omega	a Tau Alpha, Chi	x					
5	23-Sep	2PM	143	RGH.		x				x	
6	24-Sep	6AM	160	Chemistry B, M	usic B	x					x
7	24-Sep	7AM	161	Chemistry C, G	ardiner A						
8	24-Sep	8AM	156	Gardiner B, Dov	ve						
9	24-Sep	9AM	143	Monagle		x					
10	24-Sep	10AM	Lift Station	Monagle		x					
11	24-Sep	1PM	128	Garcia							
12	24-Sep	2PM	130	Piñon		x					
13	25-Sep	6AM	148	Health and Soc Dan Williams A	ial Services A,	x					
14	25-Sep	7AM	Y	Kent Hall, Busir	ness Complex	x					x

15	26-Sep	6AM	148E	Barnes and Noble	x			
16	26-Sep	7AM	157	Clara B Williams Hall, Speech Hall	х			
17	26-Sep	8AM	Y	Guthrie	х			

**Comments:** 1. Manhole Z was unable to be located, so the manhole in the Skeen Hall parking lot was used. Smoke was seen in a downstairs bathroom due to a dry P trap. 2. Manhole 163A was not found, so the next manhole downstream was utilized. Smoke was seen from the Music Building sewer vents. 3. Smoke was seen coming through a cracked doorway in the Nason House which caused smoke to exit through the chimney. 5. Smoke was seen in a bathroom on the northwest side of the building. 6. Smoke was seen from 2 neutralizing basins which are hooked up to the sanitary system. 7. Smoke test not done because the manhole is very deep with a sanitary crossing which would not allow a man to plug lines at the invert. 8. Smoke test not done due to unkown location of Dove Hall connection as well as a Hadley Hall connection that could not be smoked. 9. Smoke was seen on the south side of Monagle through roof sewer vents. 10. Lift station cover had to be removed. 11. Smoke test not completed due to heavy flow. 12. The smoke test was done on manholes not shown on the map. These manholes allowed for Piñon Hall to be isolated. 13. Smoke was seen from only the Dan Williams Hall sewer vents. 14. Smoke was seen from the sewer vents as well as a cleanout in the parking lot on the east side of Kent Hall. 15. Smoke was seen from the sewer vents as well as a bathroom on the first floor due to a dry P trap.

*Observations were based on staff members of NMSU, and Molzen Corbin. NMSU staff had access to the roof for each smoke test to determine if smoke came from roof drains or sewer vents.

Smoke test observed by:		Smoke test performed by:	
Molzen Corbin	Jonah Ruybalid EI CFM	Southwest Envirotec	Gilbert Morales

## **APPENDIX F**

## Southwest Envirotec Inspection Report

Southwest Envirotec MENY RITEXILOD R ٢P

Formerly Southwest Septic

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5486 Del Rey Blvd. Las Cruces, NM 88012

(575) 382-9596

### **NMSU Sewer Inspection Final Report**

December 7, 2014















South east corner chemistry building



South side Guthrie Hall



plastic soda bottle in cleanout on the South side of north chemistry wing



southeast corner Monagle Hall



southeast corner Monagle Hall

## **APPENDIX G**

## 2014 NMSU Sewer Map

# MOLZENCORBIN



NEW MEXICO STATE UNIVERSITY LAS CRUCES, NM SANITARY SEWER LOCATION ANALYSIS - PHASE I

			TRIVIZ DR.		1
			PAYNE S		2
129 128A			135		3
		SANITARY SEW           MH #         NORTHING           126         467189.81           127         467169.41	ER SURVEY DATA - P EASTING RIM 1486367.76 3,957 1486614.67 3,957	HASE I           EL.         INVERT DEPTH           1.86         13'6"           7.73         14'8"	4
		127 A         407137.30           128         467280.86           128 A         467036.80           8         128 B         467298.66           129         467356.85           130         467430.05           130 B         467512.61           130 C         467535.17           131         467506.90           140         467616.32           142         467399.06           143 B         467020.07           143 C         467022.20	1486335.32         3,937           1486895.20         3,963           1487190.81         3,970           1486698.45         3,959           1487090.47         3,967           1487428.24         3,976           1487436.51         3,976           1487512.10         3,976           1486352.99         3,951           1486373.92         3,951           1486371.91         3,946           1485842.23         3,935           1485834.30         3,945	3.26       6'         3.26       6'         0.68       10'         9.02       14'4"         7.28       15'10"         5.05       17'2"         4.58       10'5"         3.05       8'6"         5.20       18'5"         1.94       5'2"         1.08       6'8"         3.89       THROUGH PIPE         4.21       8'11"         5.78       4'2"         3.55       4'2"	5
LOCUST ST	72B	148         148 A         467562.55           148 C         467393.77           148 D         467431.22           149         466976.59           153         466947.39           153 A         466986.98           155         467021.20           156         467436.42           157 A         467436.42           157 B         467502.94           157 C         467572.68	1485601.16         3,944           1485536.51         3,929           1485734.02         3,932           1485734.02         3,932           1485734.02         3,932           1485734.02         3,932           1485198.83         3,922           1485387.92         3,926           1485461.53         3,926           1485182.35         3,926           1485182.35         3,926           1485182.35         3,926           1485182.35         3,926           1485363.96         3,926           1485379.93         3,927           14853445.17         3,928	COVERED           4.26         DEAD MH           9.90         6'           2.07         5'7"           5.19         3'11"           2.61         9'3"           3.59         5'3"           3.50         6'3"           2.76         9'3"           5.29         9'7"           0.21         8'4"           5.69         6'6"           9.06         0	6
	66 66 J	157 D         467486.73           159         467408.15           160         467052.42           160 A         467032.66           161         467353.83           163         466942.37           163 A         466991.98           165         467363.53           GT         467612.21           LS1         467270.73	1485334.84       3,924         1484995.32       3,915         1484768.75       3,911         1484759.41       3,911         1484742.38       3,909         1484232.09       3,894         1484237.48       3,894         1484331.00       3,896         1486568.83       3,957	4.57       DEAD MH         5.30       7'1"         1.53       7'0"         1.02       6'10"         9.60       17'3"         4.03       5'2"         2.07	7

40' 100' 200' 400'

