Eastern Washington Stormwater Effectiveness Studies

Technical Evaluation Report (TER)

Street Sweeping and Catch Basin Cleaning Comparison

Study Classification: Operational BMPs



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QAPP and TER Publication Information

The project Quality Assurance Project Plan (QAPP) and the Technical Evaluation Report (TER) will be stored and accessible to the public at the following weblink: <u>https://www.ci.ellensburg.wa.us/</u>. For questions regarding the Proposal, please contact Jon Morrow by email <u>morrowj@ci.ellensburg.wa.us</u> or phone 509.925.6819.

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Document History

The study documents were developed following the Eastern Washington (EWA) Detailed Study Design Proposal and Quality Assurance Project Plan Template for Operational Best Management Practices (BMPs). A copy of the template is located on the Washington Stormwater Center's website at the following web link: <u>https://www.wastormwatercenter.org/ew-effectiveness-studies/</u>

The Detailed Study Design Proposal (Proposal) was submitted to Ecology by Jon Morrow on June 28, 2017. Ecology approved the Proposal via email to Jon Morrow on November 8th, 2017. Appendix A of the Quality Assurance Project Plan (QAPP) contains a copy of the approval letter along with Ecology's comments on the Proposal. Appendix B of the QAPP contains a summary of responses to Ecology's comments including how the comments were incorporated into QAPP.

The draft QAPP was reviewed by members of the Technical Advisory Group (TAG) in January 2018. Appendix C of the QAPP contains a summary of the TAG's comments along with a summary of response to these comments including how the comments were addressed in the QAPP. The final QAPP was submitted to Ecology prior to the May 8, 2018 deadline for their review and comment. Appendix D of the QAPP contains a copy of Ecology's approval letter of the QAPP and a summary of Ecology's comments along with responses to the comments including how the comments were incorporated into the final QAPP document. The revised version of the QAPP was submitted on August 1, 2018.

In June 2020, the QAPP was revised as noted in the Appendix J. Summary of Revisions Table. Generally, the revisions included updating the project schedule and the Technical Advisory Group. The revisions were approved by Ecology in June 2020.

The study started in October 2018 and the last data was collected in April 2020. The draft Technical Evaluation Report (TER) was presented and submitted to the TAG in July 2020 for review and comment. The TAG comments were discussed at an August 2020 TAG meeting. Appendix Q of the TER contains a summary of the TAG's comments along with a summary of response to these comments including how the comments were addressed in this document. The final TER was submitted to Ecology in December 2020.

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2.0 Executive Summary

Street sweeping and catch basin cleaning are operational best management practices (BMPs) that are known to reduce the transport of sediment to receiving water bodies. In the EWA National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System Phase II Permit (MS4 Permit), catch basin cleaning is a required operations and maintenance (O&M) practice. The permit-required frequency of catch basin inspections (and potential cleanings) increased on December 31, 2018. Meeting these requirements creates a logistical and financial challenge for some EWA permittees due primarily to winter climate conditions which can prohibit catch basin cleaning for four months of the year. More frequent street sweeping may provide a solution to meeting the new permit requirements. Specifically, studies have shown that street sweeping can reduce the amount of sediment transported to catch basins during rainfall events. In theory, this could reduce the accumulation rate of sediment in catch basins and subsequently the frequency of which catch basins need to be cleaned.

The goals for this study were to 1) investigate whether the frequency of street sweeping significantly influenced sediment accumulation in catch basins (and transport from catch basins) during the dry season in a semiarid location, 2) recommend a combination of street sweeping and catch basin cleaning procedures for achieving permit requirements for catch basin cleaning, and 3) use the study results to justify a condition in the next permit for O&M procedures that allows street sweeping practices to offset the frequency of catch basin cleanings. These goals were achieved by conducting a two-year study in the City of Ellensburg. The study area is a 1,065-feet long section of SR 97 which includes four catch basins located on each side of the road that each discharge runoff to a swale. During year one (2018), one side of the road (test site) was swept and the catch basins were cleaned every other month starting in April and ending in October. On the other side of the road (control site), the catch basins were cleaned at the same time as the test site however the street was swept in April and October. During year two (2019), the test site and control site switched to the other side of the road and the catch basin cleaning and street sweeping only occurred once in October on the control side. Throughout the study, the City of Ellensburg followed their typical practices for street sweeping and catch basin cleaning and used the same equipment they typically use: a 2016 Elgin Crosswind J Regenerative Air Sweeper and a 2012 VacCon V311/1000 Combination Vactor Truck. Data collected during the study included: precipitation, temperature, and wind speed; street, catch basin, and catch basin washout sediment (wet) weight, moisture content, organic content, and particle size distribution (PSD); and catch basin sediment depth.

The significance of street sweeping frequency compared sediment accumulation in catch basins (and transport from catch basins) was evaluated by comparing the sediment accumulation rates during year one and two. Specifically, sediment accumulation rates from each sample event were calculated at each location (street, catch basins, and catch basin socks) and normalized (days since the last street sweep, basin area, lineal miles swept, etc). A statistical analysis was run to determine if there was a significance difference between data sets at the control site compared to the test site assuming a confidence interval of 95% (α =0.05). A two-sample t-test was used for normally distributed data.

While there was generally a decreasing trend in the sediment accumulation rates in catch basins and catch basin socks (washout) as the frequency of street sweeping increased, the differences between the test side and control side were statistically insignificant (p=0.95 and p=0.96 respectively). These results suggest that frequency of street sweeping performed within this study does not significantly reduce the rate of sediment accumulation in catch basins (and transported from catch basins). However, that does not mean that more frequent street sweeping does not have a significant effect on catch basin sediment accumulation rates. It just means the results from this study did not prove a significant difference. One reason for these results is extreme variability in site conditions (i.e., wind, sediment loading, rainfall patterns, etc.) can influence the results especially for studies with small sample sizes like this one. For future work, a longer study over multiple years and with considerably more data may mitigate the influence of extreme variability on the results and increase the likelihood of demonstrating a significant difference.

In semi-arid regions that have distinct wet and dry seasons, more frequent street sweeping during the dry season should reduce sediment transport to catch basins during the wet season. This is because rainfall events are less frequent and may not produce enough runoff energy to transfer a significant amount of sediment to catch basins. As such more frequent sweeping throughout the drier season can reduce the sediment accumulation on roads, which should reduce the sediment that could be transferred catch basins during the wet season.

A recommended schedule for catch basin cleaning based on the frequency of street sweeping was developed using the data collected from this study. A linear least squares regression analysis indicated a strong linear correlation (R^2 =0.9354) between street sweeping frequency and the time it would take for the catch basin sump to fill (60% full). These recommendations are specific to the site where the study was conducted. A literature review was conducted to identify site specific conditions that may influence the transferability of recommendations from this study to a different site. A synthesis of the literature is provided along with considerations for applying the results to other sites.

3.0 Introduction

3.1 Introduction to the Operational BMP

This study focused on evaluating the effectiveness of street sweeping and catch basin cleaning practices. These operational best management practices (BMPs) are generally described as preventative actions that prevent or reduce pollutant runoff (EPA & ASCE, 2002). Catch basins are located adjacent and flush with the curb line. Catch basins are configured with a grate inlet, which allows runoff from the roadway to enter the catch basin. Pipes (storm drains) connected to the catch basin(s) convey runoff to downstream BMPs such as swales or receiving water bodies. Catch basins typically have a low area (sump) below the invert of the pipes that can retain sediment (conveyed with roadway runoff to the catch basin), reducing the quantity of solids that are conveyed through the storm drain network into receiving waters (EPA, 1999). A vactor truck is periodically used to remove sediment from catch basins by vacuuming the solids out of the catch basin for disposal. In comparison, street sweeping removes sediment accumulation on roads, using a vacuum assisted sweeper truck. Street sweeping is known to reduce the quantity of sediments conveyed to catch basins during rainfall events (Caraco, 2000).

The Eastern Washington Phase II NPDES MS4 Permit (2014-2019) minimum control measure for Municipal Operations and Maintenance (*O&M*) specifies that permittees "...*implement an operation and maintenance program with the goal of preventing or reducing pollutant runoff from municipal operations*." In response to this requirement, the City of Ellensburg Stormwater Department developed an O&M Plan which includes street sweeping 100 miles of road and cleaning approximately 2,500 catch basins (City of Ellensburg, 2017). This typically includes sweeping the streets twice a year, once in the spring and again in the late summer, using a 2016 Elgin Crosswind J Regenerative Air Sweeper. On the other hand, approximately 600 catch basins are cleaned every year using a 2012 VacCon V311/1000 Combination Vactor Truck. In 2016, the combination of these practices collected an estimated 760 tons of solids which were disposed of at the city's decant facility and then transferred to the Wenatchee Waste Management (WM) Landfill (City of Ellensburg, 2017). *Section 4.0 provides more details about the City of Ellensburg's street sweeping and catch basins cleaning practices*.

3.2 Problem Description

The required frequency of catch basin cleaning and inspection is explicitly defined in the O&M section of the NPDES Municipal permit. Street sweeping was not required in the 2014-2019 permit however it was added to the 2019-2024 permit. With respect to catch basins, permittees are required to develop and implement an O&M plan that includes cleaning, regular inspection, and record keeping of the jurisdictions catch basins. In addition, all catch basins and inlets must be inspected once before December 31, 2018 and then every two years thereafter (Ecology, 2014). If the inspection shows it is necessary to clean the catch basin, typically when sediment exceeds 60% of the catch basin depth (Tetra Tech, 2001), the permittee must clean the catch basin. Alternatively, permittees may select other options for meeting this requirement which include (Ecology, 2013):

- 1. Establishing a specific, less frequent schedule based on documented evidence.
- 2. Identifying circuits and inspecting 25 percent of the catch basins within each circuit (frequency set by permit either annually or every two years).

3. Cleaning the whole system, including all pipes, ditches, catch basins, and inlets within a circuit once during the five-year permit term, where the circuit drains to a single discharge point.

Note: An outcome of this study is to address item 1, provide documented evidence that will support a less frequent schedule for catch basin cleaning based on the frequency of street sweeping.

Increasing the frequency of catch basin inspections (and potential cleanings), creates a logistical and financial challenge for some eastern Washington (EWA) jurisdictions. Specifically, in locations like the City of Ellensburg that typically experience prolonged durations of snow cover and ice on the roads during the winter months these climate conditions can prohibit catch basin cleaning for 4 months out of the year. Western Washington (WWA) Phase II permittees have the similar catch basin cleaning requirements (see Table 3.1), however, since most WWA jurisdictions experience significantly less snow and ice build-up (if any) on their roads, their catch basin cleaning activities are not impacted to the same degree by climate conditions. For comparison, Figures 3.1 and 3.2 are included to illustrate some of the differences in climate conditions between Ellensburg and Olympia. The subsequent paragraphs in this section provide more details about Ellensburg's climate conditions and explain why these conditions are important to this study.

Note: An outcome of this study is to demonstrate the need for O&M permit requirements that reflect EWA climate conditions.

Ellensburg is located in Central Washington, a semi-arid region with climate conditions that are characterized by cold winters with snowfall, hot dry summers with high winds (WRCC, no date), and short-duration high intensity rainfall events from late spring through early fall (WSDOT, 2016). During the dry season (April to September) the average monthly precipitation ranges from 0.24-inches (August) to 0.67 inches (May) with maximum daily wind speeds ranging from 20 mph to 25 mph. The average maximum daily temperature ranges from 61 degrees (April) to 86 degrees (August). Rainfall events during the dry season provide on average 3-inches of the 9 mean annual precipitation (MAP) and these short duration, high intensity events are known to deposit 1-inch of rain in less than 30 minutes (based on NOAA historical rainfall records). Conversely, the wet season (October to March), provides the remaining 6-inches of MAP of which an average of 22-inches occurs as snow fall.

Variables such as climatic conditions are known to influence the effectiveness of stormwater management BMPs (Caraco, 2000; Sayre, 2006; Gautam, Acharya, Stone, 2010; Tyagi, Chongtoua, Medina, 2008). For example, in semi-arid areas like Ellensburg, roadway sediment accumulation and stormwater runoff pollutant concentrations from roads tend to be higher than marine areas like Olympia. The reason for this is pollutants and sediments have more time to build up on impervious surfaces due to the longer duration of dry periods between rain events. Recommended strategies for semi-arid areas include more frequent street sweeping during the dry period to reduce the quantity of pollutants and sediments on impervious surfaces thereby reducing the quantity available for transport to catch basins and downstream water bodies (Caraco, 2000). Figure 3.3 shows an example of sediment accumulation on roads and in a catch basin in Ellensburg during the dry season.

•	WW Phase I Permit	WW Phase II Permit	EWA Phase II Permit
	Cat	ch Basin Cleaning Requirements	·
Permit Section	S5.C.10.d.i	\$5.C.7.c.iii.	S5.B.6.a.ii.b
Inspection Frequency	Annually, or alternative inspection schedule	Every 2 years, or alternative inspection schedule	Every 2 years, or alternative inspection schedule
Permit Section	S5.C.10.d.i	S5.C.7.c.iii.	
Alternative	(a) Inspection schedule may be changed to meet records of double the length of time of the propo document a specific, less frequent inspection sched	the maintenance standards based on maintenance osed inspection frequency or written statements to ule.	(1) Catch basin inspection schedule may be changed to meet the maintenance standard based on maintenance records of double the length of time of the proposed inspection frequency or written statements to document a specific, less frequent inspection schedule.
Inspection & Cleaning Schedules	(b) Annual inspections may be conducted on a "circuit basis" whereby 25% of catch basins and inlets within each circuit are inspected to identify maintenance needs.	(b) Inspections every two years may be conducted on a "circuit basis" whereby 25% of catch basins and inlets within each circuit are inspected to identify maintenance needs.	(2) Inspections every two years may be conducted on a "circuit basis", whereby 25% of catch basins and inlets within each circuit are inspected to identify maintenance needs.
	(c) The Permittee may clean all pipes, ditches, cato point) once during the permit term.	ch basins, inlets within a circuit (draining to a single	(3) The Permittee may clean all pipes, ditches, catch basins, inlets within a circuit (draining to a single point) once during the permit term.
Permit Section	\$5.C.10.a.ii	S5.C.7.a.ii	NA
Timeline for Cleaning Following Inspection	Within 6 months for catch basins, unless encounter or delay of necessary permit approvals, unexpec emergency work. For each exceedance of the requin circumstances and how they were beyond the Perm	denial or delay of access by property owners, denial ted reallocations of maintenance staff to perform red timeframe, and the Permittee shall document the ittee's control.	NA
	5	Street Sweeping Requirements	
Permit Section	S5.C.10.e	S5.C.7.d	S5.B.6.a.i.b
Requirements Involving Street Sweeping	Each Permittee shall implement practices, policies, procedures to reduce stormwater impacts associated with runoff from all lands owned/maintained by Permittee, and road maintenance activities under the functional control of the Permittee. No later than 12/31/22 document the practices, policies, procedures. Street cleaning activities must be addressed.	Implement practices, policies, and procedures to reduce stormwater impacts associated with runoff from all lands owned or maintained by the Permittee, and road maintenance activities under the functional control of the Permittee. No later than 12/31/22, document the practices, policies, and procedures. Street cleaning activities must be addressed.	Permittees shall implement a schedule of municipal O&M activities (Plan). Permittees shall review and, if needed, update the Plan no later than 12/31/22. The Plan shall include appropriate pollution prevention and good housekeeping procedures for roads, highways, parking lots including street cleaning.

Table 3.1 Comparison of WWA and EWA Catch Basin Cleaning 2019 Permit Requirements, Permits Effective August 1, 2019



Figure 3.1 Average daily wind speeds in Ellensburg (left) and Olympia (right) (Source: <u>https://weatherspark.com/averages</u>)



Figure 3.2 Average monthly precipitation depth and temperature in Ellensburg (brown) and Olympia (green) (Source: <u>http://www.usclimatedata.com</u>)



Figure 3.3 Proposed study area: typical roadway and catch basin sediment accumulation

3.3 Study Goals

The goal of this study was to determine whether the frequency of street sweeping significantly reduces the rate of sediment accumulation in catch basins (and transported from catch basins) during the dry season in a semi-arid location. The intent was to use results from this study to recommend a combination of street sweeping and catch basin cleaning procedures for achieving permit requirements for catch basin cleaning. If the study results indicate that the frequency of street sweeping significantly reduces sediment accumulation in catch basins, the results will be used to justify a condition in the next permit for O&M procedures that allows street sweeping practices to offset the frequency of catch basin cleanings.

3.4 Study Description and Objectives

A paired study was conducted on a 1065-foot section of State Route (SR) 97 with the test site located on one side of the road and the control site located on the other side (Figure 3.4). Each site has four catch basins located on the side of the road (eight catch basins total). Runoff from the road enters the catch basins through a herringbone grate inlet and then discharges from the catch basin through a storm drainpipe that outfalls into biofiltration swales (swale) (Figure 3.5). This study occurred over 2 years and data collection primarily occurred over 6 months (April to October) each year. The first year (2018), the test site was swept every other month starting in April while the control site was only swept once in April and October. The following year (2019) the control site and test site were switched to the other side of the road same street sweeping occurred every other month at the test site from April to October and only in October at the control site. All catch basins were cleaned, using a vactor truck, every other month starting in April in 2018 and 2019. Both street sweeping and catch basin cleaning followed the City's typical practices.

Sediment accumulated on the road, in the catch basins, and transferred from the catch basins was collected and measured. The sediment collected in the vactor truck and street sweeper was transported to the City's decant facility where it was dewatered and then weighed. Samples of the sediment were collected to determine the moisture content which was used to calculate the dry weight of the sediment collected. Before the catch basins were cleaned the average depth of

sediment accumulated in the catch basins was measured at five different locations in each catch basin. Then sediment was collected from each catch basin using the City's vactor truck. The storm drainpipe outfalls were fitted with a catch basin sock which captured sediment that was transported from the catch basins before discharging to the swales (Figure 3.5). Every other month, the catch basin sock was collected (replaced) and the dry weight of sediment collected in each sock was determined. The particle size distribution (PSD) of sediments collected from each location (roadway, catch basins, and catch basin socks) was determined. Organic content was also determined only for the catch basin sediment. Climate data (precipitation and wind speed) were collected over the duration of the study period. Section 5.0 contains more details regarding data collection.

The study goals were achieved by meeting the following objectives:

- 1. Characterize the sediment collected (particle size distribution and organic content) of from each sample location (roadway, catch basins, and catch basin socks) at both the test site and control site.
- 2. Quantify the accumulation rate of sediment on the street, in catch basins, and in catch basin socks, without employing (control site) and while employing (test site) street sweeping.
- 3. Identify potential weather-related methods of sediment transport to the road, catch basin, and catch basin socks and assess representativeness of the climate conditions during the study (compared to historical records)
- 4. Determine whether there is a statistically significant difference between the sediment accumulation rate in the catch basins and in the catch basin socks (washout from the catch basin) at the test site compared to the control site.
- 5. Evaluate whether there is a correlation (using a regression analysis) between catch basin sediment accumulation rates and street sweeping frequency that could be used to develop a schedule for catch basin cleaning and provide recommendations for applying the results.
- 6. Summarize the study results.











¹ The test-site and control-site will switch to the other sides of the road for year two.

Figure 3.6 Aerial view of the proposed study area showing the locations of the test site and control site

Note: For year one, the test site was the north side of the road, and the control site was the south side of the road. During year two, the south side was the test site and the north side was the control site.

3.5 Study Location

The proposed study area was a 1065-foot section of road on State Route 97 located in Ellensburg, Washington between Desmond Road and West University Way (Figure 3.6). This principal arterial is a major hay hauling route and the land use in the study area is primarily commercial and light industrial. The road has four 12-foot lanes, a 12-foot turning lane, and two 4-foot shoulders (Figure 3.7). The speed limit on the road is 40 mph with an approximate average daily traffic (ADT) of 4000. The study location was selected because the proposed test site and control site provide equivalent areas for comparison including:

- The areas have the same average daily traffic (ADT), roadway topography, land use, and the same number of catch basins which are configured to discharge to swales.
- Typical variables that affect the results are not present at the study location such as leaf litter from tree canopies and parking is not permitted on the road so parked cars will not interfere with street sweeping and catch basin cleaning practices.

The study area was surveyed in July 2017 (Appendix A) and the results of the survey were used to delineate the basin areas summarized in Table 3.2, Figure 3.8, and described herein. The study area starts at station 0+00 and ends at station 10+65 and the longitudinal roadway slopes is 0.33% from the North West to the South East. The roadway crown is in the center of the highway which directs half of the runoff to each side of the road. The area contributing runoff to each catch basin is from PGIS which includes the road and approaches (Figure 3.9) to local. The area adjacent to the approaches (away from the road) is not included in the basin delineation because these areas slope away from the road. The contributing basin areas to the catch basins range from 0.17 to 0.30 acres. Area differences are due to the locations of the inlets and the size of the approaches.



Figure 3.7 Street view of the proposed study area on SR 97

Catch Basin ID	Contributing Drainage Area (AC)
CB-1	0.19
CB-2	0.19
СВ-3	0.29
CB-4	0.26
CB-5	0.17
СВ-6	0.17
CB-7	0.30
CB-8	0.25



Figure 3.8 Basin delineations



Figure 3.9 Approaches contribute runoff to catch basins

4.0 Operational BMP Description

The city's typical street sweeping and catch basin cleaning practices were documented from interviews with the equipment operators and the city's stormwater manager. A copy of the interview notes is located in Appendix E of the QAPP. This section provides a summary of the typical operating procedures for street sweeping and catch basin cleaning.

4.1 Street Sweeping

Street Sweeping occurs twice per month for principal arterials, once per month for secondary arterials, and once per year for collectors. The streets are swept using a 2016 Elgin Crosswind J Regenerative Air Sweeper. Regenerative air sweepers use rotating brooms and pressurized air on the street side of the pickup head under the vehicle to dislodge material from the street surface. Brooms rotate in opposite directions toward the center of the vehicle to direct material to the pickup head instead of to the outside of the vehicle (i.e. curb and gutter). A vacuum is applied on the opposite side of the pickup head from the pressurized air to pull material into the hopper. The frequencies and practices were modified during the study to sweep the test and control site once every other month and immediately following catch basin cleaning. The detailed modifications to procedures for this study are described in more detail in Section 8.1.3 of the QAPP. Typical street sweeping procedures in Ellensburg are as follows:

- Step 1: At the start of the route to be swept, the sweeper pulls alongside the curb as closely as possible while still allowing the rotating brushes to reach the gutter.
- Step 2: Once the sweeper is aligned with the curb, the manifold at the front of the sweeper releases water to wet the pavement. The water is used to provide dust control, particularly later in the day, when transport of fines by wind is expected to be higher. Once the manifold is started, the brooms begin to rotate and are lowered, and the blower and vacuum near the rear of the sweeper is started.
- Step 3: The sweeper drives along the curb and gutter until the route is completed. Because higher amounts of material are expected to collect in and adjacent to the gutter, a single pass on each side of the street is typical. Once a year and following the winter season, an additional pass along the center median of arterials is performed to capture material in or next to the center median.
- Step 4: After sweeping is complete, the sweeper drives to the City's decant facility for disposal of material collected on the route.

4.2 Catch Basin Cleaning

To date, each catch basin is cleaned approximately once every four years using a 2012 VacCon V311/1000 Combination Vactor Truck. This frequency was modified during the study to clean catch basins at the test and control site every other month. During the months when both street sweeping and catch basin cleaning occur the catch basins were cleaned prior to street sweeping. The modifications to procedures for this study are described in more detail in Section 8.1.2 of the QAPP. Typical catch basin cleaning procedures in Ellensburg are as follows:

• Step 1: The vactor truck drives to the catch basin to be cleaned, and parks alongside the curb so the front of the truck and vactor arm are in line with the inlet.

- Step 2: The catch basin grate is removed, and the arm is lowered to the bottom of the catch basin by use of remote control.
- Step 3: The vacuum is started and a high-pressure water hose attached to the truck is used to wash any material adhered to the walls of the catch basin towards the bottom of the catch basin.
- Step 4: Once the accumulated material and water is removed from the catch basin, the vactor is removed and the grate is replaced on the catch basin.
- Step 5: Material collected during the catch basin cleaning is transported to the City's decant facility for disposal.

4.3 Equipment

The City of Ellensburg Stormwater O&M Plan includes street sweeping 100 lineal miles of road and cleaning approximately 2500 catch basins (City of Ellensburg, 2017). The city owns one street sweeper, an Elgin Crosswind J street sweeper, and two vactor trucks, VacCon Combination Truck. A summary of the equipment specifications is summarized in Table 4.1 with detailed equipment information located in Appendix E of the QAPP.

Table in Streeper and Variation Equipment Speemeanor	-5
2016 Elgin Crosswind J Street Sweeper (2016	Freightliner Chassis)
Material Storage Capacity	8 CY
Broom Type	Dual Gutter Brooms
Total Sweeping Path	120 in.
Vacuum Pickup Head	2700 sq. in.
Blower Rating	20,000 cfm
Water Storage Capacity	240 gal
Number of Spray Nozzles	16
Pick-Up Efficiency	96.4%
2012 VacCon V311/1000 Combination Truck (201	12 International Chassis)
Material Storage Capacity	11 CY
Diameter of Vacuum Hose	8 in.
Vacuum Pickup Head	200 in. H ₂ O
Blower Rating	8000 cfm
Water Storage Capacity	1000 gal

Table 4.1 Street Sweeper and Vactor Truck Equipment Specifications

5.0 Sampling Procedures

5.1 Types of Data Collected

This section provides an overview of the types of data that was collected. Table 5.1 summarizes the various types of data collected, the location where data was collected, equipment used to collect data, the frequency of data collection, and the total number of samples collected. Table 5.2 provides a timeline for when this data was collected. An overview of the sampling procedures is in the subsequent sections and the detailed sampling procedures are in Section 8.0 of the project QAPP. Appendix B-E contains the raw data measurements for each sample event.

Data Type	Data Collection Location	Equipment Used to Collect Data	Frequency	Total Number of Samples
Precipitation, Temperature, and Wind Speed	Weather Station	Weather Station	Daily throughout the study	Continuously
Catch Basin	All <i>Test Site</i> Catch Basins	Survey Rod	Every other month	32
Sediment Depth	All Control Site Catch Basins	Survey Rou	were cleaned	32
Catch Basin Sediment Wet	All <i>Test Site</i> Catch Basins	Vactor Truck	Every other month for two 6-month periods;	8 & 21
Weight and Moisture Content	All Control Site Catch Basins	Vactor Truck	starting on April and ending in October	8 & 21
Roadway Sediment	Roadway Length at <i>Test Site</i>	Street Sweeper	Every other month for two 6-month periods;	8 & 21
Wet Weight and Moisture Content	Roadway Length at <i>Control Site</i>	Succi Sweeper	starting on April and ending in October	3 & 7
Catch Basin Sock	All <i>Test Site</i> Catch Basin Socks	Manual	Every other month for two 6-month periods;	24
Weight	All <i>Control Site</i> Catch Basin Socks	Wanuar	starting on April and ending in October	25
Roadway, Catch Basin, and Sock Sediment PSD	Each <i>Test Site &</i> <i>Control Site</i> sample location (roadway, catch basin, socks)	Manual	Two times per year from April through October (Roadway and Sock), 4 times per year from April through October (Catch Basin)	4, 16, & 6
Roadway, Catch Basin, and Sock Sediment Organic Content	All <i>Test Site &</i> <i>Control Site</i> (roadway, catch basin, socks)	Manual	2-3 times per year	9, 22, & 2
Catch Basin Bulk Density	All Test Site & Control Site	Manual	1 time	3 & 3

Table 5.1 Summary of Data Collected

				2018 (N	North sid	le of SR	97 was te	est side)						20	19 (Sout	h side of	[•] SR 97 w	vas test si	ide)					20	20	
Location	Activity	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Study Area	Weather Station	X	X	Х	Х	Х	Х	X	X	X	Х	Х	Х	X	Х	X	Х	Х	Х	Х	X	Х	Х	X	Х	X
	Street Sweep	\mathbf{X}^1		$\mathbf{X}^{1,4}$		X ^{1,6}		\mathbf{X}^1						\mathbf{X}^1		X ^{1,4}		\mathbf{X}^1		$X^{1,4,6}$						
Test Site	Catch Basin Cleaning	X ^{2,3,4,6}		X ^{2,3,4}		X ^{2,3,4,6}		X ^{2,3,4}						X ^{2,3,4,6}		X ^{2,3,4}		X ^{2,3,4,6}		X ^{2,3,4,6,8}						
	Catch Basin Sock Sediment			X ^{4,5}		X ⁵		X ⁵						X ^{5,7}		X ^{4,5}		X ⁵		X ^{4,5}						$X^{4,5,6}$
	Street Sweep	\mathbf{X}^1						\mathbf{X}^1												$X^{1,4,6}$						
Control	Catch Basin Cleaning	X ^{2,3,4,6}		X ^{2,3,4}		X ^{2,3,4,6}		X ^{2,3,4}						X ^{2,3,4,6}		X ^{2,3,4}		X ^{2,3,4,6}		X ^{2,3,4,6,8}						
Site	Catch Basin Sock Sediment			X ^{4,5}		X ⁵		X^5						X ^{5,7}		X ^{4,5}		X^5		X ^{4,5}						X ^{4,5,6}

Table 5.2 Data Collection Schedule over the Study Duration

Street Sediment Weight - Collected roadway sediment and measured the wet weight from the control site twice (2018) and once (2019) and from the test site four times per year (8 total) for a combined total of 11 wet weights over the duration of the study. After weighing the sediment, triplicate samples of sediment were collected and submitted to the lab to measure the moisture content. The analytical laboratory used at the beginning of the study made an error and created a composite of the first set of samples (one sample from each location instead of triplicates from each location). Following this incident, the samples were sent to a different lab for the duration of the study. As such, a total of 28 samples were collected and analyzed over the duration of study.

2. Catch Basin Sediment Weight - Collect sediment from all the catch basins at the control site and then all the catch basins at the test site. The sediment wet weight was measured four times per year for a total of 8 wet weights per year (16 wet weights total over the duration of the study). After weighing, triplicate samples of sediment were collected and submitted to the lab to measure the moisture content. The analytical laboratory used at the beginning of the study created a composite of the first set of samples. Following this incident, the samples were sent to a different lab for the duration of the study. As such, a total of 42 samples were collected and analyzed over the duration of study.

Catch Basin Sediment Depth - Measured the depth of sediment in each catch basin every other month at the test site (16 catch basins per year for a total of 32 measurements over the duration of the study) and at the control site (16 catch 3. basins per year for a total of 32 measurements over the duration of the study).

- 4. Particle Size Distribution (PSD) Sediment samples were collected and submitted to the lab to determine the PSD. The samples were collected from the roadway sediment (3 from the test site and 1 from the control site for a total of 4 over the duration of the study), the catch basin sediment (8 from the test site and 8 from the control site for a total of 16 over the duration of the study), and catch basin sock sediment (3 from the test site and 3 from the control site for a total of 6 over the duration of the study).
- 5. Catch Basins Sock Sediment Weight - Collected sediment that washed out from the catch basins (into the socks located in the catch basins) and submitted the socks to the lab to determine the sediment dry weight. This included collecting the socks every other month that are located in the catch basins at the test site (12 socks for year one and 12 socks for year one and 16 socks) and at the control site (9 socks for year one and 16 socks) and at the control site (9 socks for year one and 16 socks). for year two for a total of 25 socks over the duration of the study). It is important to note that due to the site configuration, there are 4 catch basins on the north side of the road and only 3 catch basins on the south side of the road.
- Organic Content Samples of sediment from the street sediment and catch basins were submitted to lab to determine the organic content measured as total volatile solids (TVS). Triplicate samples were collected during each sample event 6. except for two events when the lab erroneously combined the triplicate sample into a composite sample before testing the organic content. Samples were collected from the street sediment once per year at the test site (for a total of six samples over the duration of the study) and once from the control site during year two (for a total of three samples over the duration of the study). Samples were collected from the catch basins at the test and control site twice during year one (for a total of four samples from the test site and four from the control site) and three times at the test and control site twice during year two (for a total of seven samples from the test site and seven from the control site). Samples were collected from the catch basin socks once from the test and control site in April 2020 for a total of 2 samples.
- Lab Fire Catch basin socks that were collected during the April 2019 data collection event were destroyed in a fire. The fire occurred at the analytical lab during the drying process used to obtain the dry weight of the catch basin socks. 7. Following the fire, the lab adjusted their procedures to minimize the possibility of another fire. Because the data was lost, a catch basin sock was installed in October 2019 and collected in April 2020 to approximate how much sediment would have been collected in the catch basin sock in April 2019. The April 2020 catch basin sock results are substituted for the April 2019 catch basin sock results throughout this report.
- 8. Catch Basin Sediment Bulk Density - The bulk density of sediment collected in the catch basins from the test site (n=3) and the control site (n=3) was measured at 80% compaction. This information was collected to estimate the weight of sediment when the catch basins are full (~60% depth) as part of the analysis to determine the relationship between catch basin accumulation and street sweeping frequency (Section 7.5).

5.2 Sample Collection Process and Design(s)

This section provides an overview of the process for collecting the various types of data including the equipment that was used to collect samples and where applicable the design of the sample collection system is described. Reference Section 8.0 of the QAPP for the detailed standard operating procedures (SOPs) for collecting samples and measuring field data.

5.2.1 Weather Data

A weather station recorded precipitation, temperature, and wind speed data continuously at 15minute intervals throughout the duration of the study. The weather station is located at 1306 W. Dolarway Road, which is approximately 1.5 miles from the study area as shown in Figure 5.1. The parcel where the weather station is located is owned by DirectTV, Inc. Personnel at that property operated and maintained the weather station. This weather station stopped operating November 25, 2018 through March 6, 2019 and June 16, 2019 through the end of the study, potentially due to equipment malfunction. An equivalent weather station was located at Central Washington University (CWU) and data from this station was used to replace missing data from November 25, 2018 to March 6, 2019 and from June 17, 2019 to the end of the study. The CWU station is located on the roof of the Hogue Technology Building on campus, approximately 2.5 miles from the study area as shown in Figure 5.1. CWU staff operated and maintained the weather station.



Figure 5.1 Location of Weather Station in Relation to the Study Area

The 1306 W Dolarway Rd and CWU weather stations are Davis Instruments Vantage Pro2 stations, which measure rainfall, wind speed and direction, temperature, and humidity. Precipitation depth is recorded using a tipping bucket. The bucket has a level of accuracy of $\pm 4\%$ or ± 0.01 -inches, whichever is greater, for rain rates up to 4-inches per hour. Rainfall data is recorded every 20-24 seconds. A storm event is recorded once 0.02-inches has accumulated within the bucket, and the storm event is ended after 24 hours without further accumulation.

Wind speed is measured using a cup anemometer in 1 mile per hour (mph) increments and recorded every 2.5 to 3 seconds. The data is compiled into 10 to 15-minute intervals. The meter has a range of 1 to 200 mph and an accuracy of ± 2 mph or $\pm 5\%$, whichever is greater.

Temperature is measured using a PN junction silicone diode (thermal diode), located beneath a solar radiation shield on the station. The temperature sensor measures temperature between -40°F and 150°F. The temperature sensor is accurate to within ± 0.5 °F. Temperature is updated every 10 seconds and is compiled into 10- to 15-minute intervals.

Data recorded by the weather stations is uploaded to Weather Underground (<u>wunderground.com</u>), a website which presents forecast and historical weather data. Data for the weather station at 1306 W Dolarway Road can be accessed and downloaded by the public at the webpage for the station (<u>https://www.wunderground.com/personal-weather-station/dashboard?ID=KWAELLEN22</u>). Data for the weather station at CWU can be accessed and downloaded by the public at the webpage for the station (<u>https://www.wunderground.com/dashboard/pws/KWAELLEN13</u>).

5.2.2 Catch Basin Sediment Depth

The depth of sediment in each catch was measured using a fiberglass, telescoping survey rod with hundredths of a foot gradations. This included measuring from the rim of the catch basin to the top of the sediment in five different locations (Figure 5.2) before cleaning catch basins and subtracting these measurements from the depth of the catch basin empty. The average sediment depth in each catch basin was determined by averaging the five measurements. The SOP for measuring the sediment depth is located in Section 8.1.1 of the QAPP.



Figure 5.2 Catch basin sediment depth: measure in five locations full (left) and empty (right)

5.2.3 Catch Basin Sediment Wet Weight and Moisture Content

The catch basin sediment was collected from the test site and control site separately in the city's vactor truck (Figure 5.3) following the procedures defined in Section 8.1.2 of the QAPP. The sediment was transported to the city's decant facility. Once the truck arrived at the decant facility, the sediment was transferred to a basin for dewatering (Figure 5.4). The transfer of sediment to the basin took approximately 5-10 minutes to prevent water and sediment from spattering outside of

the basin. Any excess which fell outside the basin was shoveled into the basin. The dewatering basin was retrofitted with drains covered with a 1 micron felt filter fabric and attached to ball valves. However, the filter fabric immediately clogged during the first sampling event, inhibiting drainage. The filter fabric was removed, and the dewatering basin and sediment were allowed to sit for 5-7 days to allow small particles to settle to the bottom of the basin. The sediment was dewatered by opening the valves according to the SOPs in Section 8.1.5 of the QAPP.

After excess water was drained, the basin was transported to a scale using a forklift and pallet located under the basin to measure the weight. A Coti Global floor scale and Transcell TI-500E SS digital indicator were used to measure the weight. The scale is 4-feet by 4-feet, with a 10,000-pound capacity. The digital indicator is set to display load from the floor scale in 0.1-pound increments. The sensitivity of the scale and digital indicator is 3 millivolts per volt (mV/V). The accuracy of the scale is $\pm 1.06\%$. Additional information about the scale and digital indicator is in Appendix M of the QAPP and the scale calibration is described in Section 8.1.3 of the QAPP. After the sediment was weighted, three samples were collected and submitted to the lab to determine the moisture content of the sediment collected.



Figure 5.3 Catch Basin Sediment Accumulation Data Collection



Figure 5.4 Dewatering Basin Prior to Settling (Left) and Following Dewatering (Right)

5.5.4 Roadway Sediment Wet Weight and Moisture Content

The roadway sediment was collected from the test site and control site separately in the city's street sweeper following the procedures defined in Section 8.1.3. Sediment from the test site and control site was collected and weighted separately. The sediment was transported to the city's decant facility and transferred to a basin for dewatering (Figure 5.5). Transfer of the sediment to the basin took approximately 5-10 minutes to prevent water and sediment from spattering outside of the basin. Any excess which fell outside the basin was shoveled into the basin. The process for dewatering, weighting the sediment, and collecting moisture content samples is the same as described in Section 5.2.3 of the QAPP.



Figure 5.5 Roadway Sediment Accumulation Data Collection

5.5.5 Catch Basin Sock Sediment Dry Weight

Sediment washed out of the catch basins through the storm drainpipe was collected in a sock (a 1micron filter bag) that was installed in a catch basin on the discharge end of the pipe in the swale. An example of the typical setup is illustrated in Figure 5.6. The QAPP contains detailed installation in Figure 7.8b and a copy of the sock cut-sheet is in Appendix G. The catch basin was retrofitted with 1-inch drain holes on the bottom of the catch basin to allow excess water to drain from the catch basin. Underneath the catch basin, existing soils were replaced with a 2-foot by 2-foot by 2foot section of 3-inch to 1½-inch gravel infiltration trench. The trench provided additional storage for runoff discharging from the catch basin to reduce the amount of water in the catch basin, subsequently reducing the period that the sock is saturated. Sediment captured in the sock was collected every other month after the respective catch basin is cleaned (Figure 5.7). This included flushing the drainpipe of any residual sediment using the hose on the vactor truck. After excess water drained from the sock, the sock was collected and replaced with a new sock. The old sock was transferred to a sealable plastic container and submitted the lab to determine the sediment dry weight collected in each sock. The standard operating procedures for collecting sediment washout from catch basins is in Section 8.1.4 of the QAPP.



Figure 5.6 Typical Detail for Catch Basin Sock Installation



Figure 5.7 Catch Basin Socks: after 2 months use (left), uninstalled (middle), installed and new (right)

5.5.6 Street, Catch Basin, and Catch Basin Sock Sediment Particle Size Distribution

One to four times each year (see Table 5.2), samples of sediment collected from the roadway, catch basins, and catch basin socks were analyzed for organic content and particle size distribution. After the sediment was weighed, samples were collected and submitted to the lab for analysis. The QAPP includes standard operating procedures for collecting samples in Section 8.1.6 and laboratory testing methods and procedures in Section 9.0.

6.0 Data Quality Assessment

This section describes the assessment performed to review the quality of the data collected during the study. The purpose of the assessment was to determine whether measurement performance criteria (MPC) identified in the project QAPP were met for each of the six data quality indicators (DQIs). DQIs are qualitative and quantitative measures that characterize the aspects of quality data, and the DQIs for the project include bias, precision, representativeness, completeness, comparability, and sensitivity. MPCs are the acceptance criteria for the DQIs which specifies how good the data must be to meet the project objectives. Detailed definitions of each DQI and descriptions for each MPC are included in Section 6.0 of the project QAPP. This section describes the evaluation of each DQI with respect to the MPCs for the data collected during the study. An audit was conducted each year (Appendix M) to verify the study was conducted in conformance with the QAPP.

6.1 Bias

Bias is a systematic error that results in sample values that are consistently distorted in a particular direction from the "true" or known value (EPA, 2006; Erickson, 2013). Bias can result from improper data collection, poorly calibrated analytical or sampling equipment, or limitations and errors in analytical methods and techniques (Ecology, 2011).

DQI #1: Following the manufacturer's recommendations for equipment maintenance can reduce the potential of bias in the quantity of sediment collected.

MPC #1: All equipment maintenance will be performed per the manufacturer recommendations and at the frequency recommended by the manufacturer.

Assessment: Routine maintenance and minor repairs were conducted on the vactor truck and sweeper during the study duration. Maintenance was conducted in accordance with manufacturer recommendations as verified from audits (Appendix M) of the maintenance records (Appendix N).

DQI #2: Consistently following the SOPs for collecting samples and measuring data will minimize errors and reduce the potential of collecting biased data.

MPC #2: The field crew will follow the SOPs defined in the project QAPP.

Assessment: Field audits were performed in June 2018 and August 2019 (Appendix M) to assess whether the field crew was following the SOPs. Results from the audits indicate that the field crew followed the SOPs (QAPP Section 5.2).

DQI #3: The scale used to weigh sediment during the study will be calibrated per manufacturer's recommendations to reduce the potential for bias in the sediment weight data.

MPC #3: The scale calibration will occur prior to the start of data collection for each year.

Assessment: The City rented the scale from the vendor during the study. The vendor would deliver in the scale in April to the decant facility and pick the scale up in October. Once

the scale was delivered, the vendor would calibrate the scale as part of the contract with the City.

6.2 Precision

Precision is a measure of agreement among repeated measurements of the same property taken under identical or substantially similar conditions (EPA, 2006; Erickson, 2013; EPA, 2002). Data is considered precise when the measured values are consistently the same and imprecise when the measured values are consistently different (Erickson, 2013). Random error is a common cause of imprecise data and is always present because of normal variability in the many factors that affect measurement results. For example, variability in sampling or data collection procedures and/or variations of the actual concentrations in the media being sampled (Ecology, 2011).

DQI #1: Developing and consistently following the SOPs for collecting samples and measuring data will reduce the potential of collecting imprecise data.

MPC #1: The field crew will follow the SOPs in the project QAPP.

Assessment: Field audits were performed in June 2018 and August 2019 (Appendix M) to assess whether the field crew was following the SOPs. The results of the audits indicate that the field crew consistently followed the SOPs (QAPP Section 5.2).

DQI #2: Incorrectly reading instruments (e.g., survey rod) when measuring the sediment depth could result in the collection of imprecise data.

MPC #2: When the first catch basin depth is measured, the depth will be measured by two different data collectors with the same instrument. The results of the two data collectors should be consistent, or measurement procedures should be corrected until they are the consistent.

Assessment: During the first sample collection event (April 2018), two members of the field staff measured the sediment depth (duplicate measurements) in a catch basin in five different locations. Initially the duplicate measurements were inconsistent. The field staff reviewed the SOPs for measuring sediment depth and repeated the measurements. The second duplicate measurements were within a hundredth of a foot. The survey rod used to measure depth has 100th gradations and is considered accurate to within a 100th of a foot (± 0.05 feet) as such the duplicate measurements are considered consistent.

DQI #3: Duplicate analytical testing will be performed for parameters shown in Table 9.2 to verify the quality of the results.

MPC #2: If the results of the duplicate testing indicate that the relative percent difference (RPD) is $\leq 20\%$, the results of the analytical testing will be considered acceptable.

Assessment: RPD calculations were performed on the data collected with duplicate and/or triplicate measurements. The following identifies the data and provides a summary of the RPD results. Appendix O contains the detailed results from the RPD analysis.

- Street and Catch Basin Sediment Moisture Content and Organic Matter Triplicate moisture content and organic matter samples were collected from each sample location (test and control sites for both street sediment and catch basin sediment). Moisture content samples were collected from each sample event and organic matter samples were collected between one to three times per year (reference Table 5.2 footnotes). The RPD for most of these measurements was greater than 20%. Results from the audit along with follow up discussion with the field crew indicate the sample collection SOPs were followed as such it is assumed that improper sample collection was not the reason for these results. Another reason may be related to the sediment characteristics which are known to influence both the moisture and organic matter content measured in samples. The characteristics of sediment on streets and in catch basin is known to be highly variable which may influence the results of these tests (USGS, 2007; Pitt, et. al., 1984; Tang, 2016). In addition, for the study location hay is known to make up a portion of the sediment composition. Considering hay can retain water, samples with a higher fraction of hay will likely have a higher moisture and organic matter content compared to samples with less hay. The RPD analysis was repeated using the three calculated dry weights for each sample event for each sample location to determine how the variance in the moisture content may influence the dry sediment weight. The RPD was less than 20% for all samples. Based on this calculation the RPD is considered acceptable.
- Catch Basin Sock Sediment Dry Weight The RPD was calculated based on the duplicate measurements of the sediment dry weight after the socks were dried. Two of the sock sediment weights exceeded 20% as such they were removed from the analysis to calculate the average dry sediment weight for the data collection event.

6.3 Representativeness

DQI #1: The study operational procedures are consistent with the jurisdiction's typical operational procedures.

MPC #1: The SOPs were developed to mimic the jurisdiction's typical operational procedures. Data will be considered acceptable if the equipment operators are consistently following the SOPs in the project QAPP.

Assessment: Field audits were performed in June 2018 and August 2019 (Appendix M) to assess whether the field crew was performing data collection in accordance with the SOPs (QAPP Section 5.2). The results of the audits indicate that the field crew was following the SOPs and therefore was mimicking typical operational procedures for the jurisdiction.

DQI #2: Inclement weather or unusual weather could provide study results that are not representative of typical weather conditions in Ellensburg.

MPC #2: The weather during the study will be considered representative if the historical weather data is similar to the data collected at the weather station.

Assessment: Weather data was collected for the duration of the study and compared to historical weather data for Ellensburg (Section 7.3). During the study, several intense rainfall events occurred which may have affected results from specific data collection events. However, it is not possible to determine if these single events were unique compared

to historical records because most available records only include daily and monthly precipitation depths. As such an intense storm that occurred over an hour may not appear high, when compared to daily or monthly historical averages. In addition, short duration high intensity rainfall events are common for the project location (Ecology, 2019). The average precipitation for Ellensburg is 9-inches and during the study the measured precipitation was lower at 7.09-inches and 7.32-inches in 2018 and 2019 respectively. Considering stormwater runoff quantity and flow rates are known to influence sediment transport to catch basins (Tang, 2016), the sediment collected from the catch basins during the study maybe slightly lower compared to an average year.

DQI #3: Developing SOPs and following them consistently will support the representativeness of the collected samples.

MPC #3: Data will be considered acceptable if the field crew is consistently following the SOPs in the project QAPP.

Assessment: Field audits were performed in June 2018 and August 2019 (Appendix M) to assess whether the field crew was following the SOPs. Results from the audits indicate that the field crew followed the SOPs (QAPP Section 5.2).

6.4 Completeness

DQI #1: The sample size selected for the study is expected to provide a sufficient amount of data to support conclusions.

MPC #1: The data set is considered complete when the number of valid samples collected is equal to the sample size defined by the DQI.

Assessment: The number of samples proposed at the beginning of the study were obtained between April 2018 and April 2020. Catch basin material depth, catch basin and street sweeping material dry weights, organic content, and particle size distribution samples were collected as defined in the QAPP during the 6-month data collection periods in 2018 and 2019. The exception was two data collection events when triplicate samples were intended to be collected to measure the moisture content and organic matter and instead the lab combined to three samples before running the test. The catch basin socks collected in April 2019 were lost in a lab fire (see Table 5.2); to replace the lost data catch basin socks were installed in October 2019 and collected in April 2020.

DQI #2: Procedures are defined for handling missing data, coding of missing data, and reporting of missing data with results.

MPC #2: Procedures for handling missing data and coding missing data are defined in Section 11.0 of the project QAPP. The TER will include consideration for how missing data could limit the comparability of the data set.

Assessment: The only missing data was from two data collection events when triplicate samples were intended to be collected to measure the moisture content and organic matter and instead the lab combined to three samples before running the test. Considering the

triplicate samples were combined before testing these samples were considered acceptable an included in the data set.

6.5 Comparability

DQI #1: Define the process and provide justification for selecting the test site and control site.

MPC #1: The process for selecting the study area is defined in Section 7.2 of the project QAPP. The process focused on having a test site and control site that are equivalent.

Assessment: Selection of the test and control sites are discussed in the project QAPP. With respect to comparing this site to other sites in Ellensburg or other locations, it will be important to consider specific site conditions that can vary by location. These conditions are detailed in Section 7.5.

DQI #2: Consistently following SOPs for sample collection and field measurements will improve the comparability of the data within the study.

MPC #2: Data will be considered acceptable if the field crew is consistently following the SOPs in the project QAPP.

Assessment: Field audits were performed in June 2018 and August 2019 (Appendix M) to assess whether the field crew was following the SOPs. Results from the audits indicate that the field crew followed the SOPs (QAPP Section 5.2).

DQI #3: Defining and using standard testing methods will improve comparability of analytical data collected.

MPC #3: Data will be considered acceptable if it follows standard test methods. Standard testing methods are defined for the project in Table 9.2 of the project QAPP.

Assessment: Standard testing methods (and the same methods) were consistently used by the analytical laboratories to test moisture content, particle size distribution, organic content, and the catch basin sock sediment dry weight.

6.6 Sensitivity

DQI #1: Instruments capable of accurately measuring the variables of interest during the study should be used.

MPC #1: Data will be considered acceptable if instruments used are capable of measuring the different levels expected during the study.

Assessment: The instruments used in this study (scale, survey rod, weather station, and standard analytical testing methods) are capable of measuring the different levels expected during the study.

7.0 Results and Discussion

The goal of this study was achieved by completing the objectives outlined in Section 3.4. Each objective is noted in the subsequent section along with a summary of how the objective was achieved, the results, and discussion. The QAPP Table 9.2 defines the Standard Testing Methods for parameters tested at a laboratory and a detailed summary of the data analysis methods is in Section 14.0.

7.1 Sediment Characterization

Objective 1: Characterize the sediment collected (particle size distribution and organic content) from each sample location: on the street, in catch basins, and transferred from the catch basin (washout) at both the test site and control site.

Objective 1 was achieved by testing the particle size distribution (PSD) and organic content of sediment collected from each sample location. Results for PSD testing are first described in this section followed by the results for organic content. Appendix F and G contains the detailed results.

7.1.1 Sediment Particle Size Distribution

The sediment PSD was measured to determine the range of particle size at each sample location. Specifically, the range of particle size collected by the street sweeper, retained in catch basins, and washed out of the catch basins into the socks. Figure 7.1 and Table 7.1 provides a summary of the results from each sample location including the average PSD from the north and south side of the road, the overall average PSD (north and south combined), and the median sediment diameter (d50) of the overall average PSD. A summary of the number of samples collected each year is as follows:

- Street Sediment (SS) sediment collected by the street sweeper was tested once each year (2018 and 2019) from the north side of the road (n=2) and the south side of the road (n=2).
- Catch Basin (CB) sediment in the catch basins, collected by the vactor truck, was tested three times during the first year of the study (2018) and four time during the second year (2019). Sediment collected from all the north side catch basins was combined and tested (n=7) and sediment from all the south side catch basins was combined and tested (n=7).
- Catch Basin Socks (CBS) sediment that washed out of the catch basins and into the socks was tested once the first year (2018), twice the second year (2019), and once in April 2020 (reference Table 5.2 footnote 7). Sediment collected from all the north side catch basin socks was combined and tested (n=4) and sediment from all the south side catch basins was combined and tested (n=4).

As shown in Figure 7.1 the largest sediment was collected from the street (d50=2.0mm) followed by the sediment collected in the catch basins (d50=0.8mm) with the smallest sediment washed from the catch basin into the socks (d50=0.05mm). Based on the d50 measurements, the sediment is classified as very fine gravel to very coarse sand (Street Sediment), coarse sand (catch basins), and silt (catch basins socks). These results are consistent with other studies which suggest that street sweepers are more efficient for picking up the larger size sediment while smaller sediment (d50<0.10mm) can washout of catch basins (Elgin, 2009; Tang, 2016; Rockford et. al., 2009).



Figure 7.1 Semi Log Graph of Average Sediment PSD

	Doutialo Sizo		Averages (%)	
Sieve Size	(mm)	CB n=14	SS n=4	CBS n=8
1"	25.400			
3/4"	19.000	100.0	100.0	100.0
1/2"	12.700	98.4	98.0	99.3
3/8"	9.510	97.4	93.7	98.4
1/4"	6.350	90.5	82.5	94.5
#10	2.000	74.1	50.7	83.1
#16	1.190	59.2	38.0	77.0
#30	0.595	45.3	24.3	72.6
#40	0.420	40.4	19.3	70.8
#100	0.149	22.1	9.3	63.1
#200	0.074	17.7	6.1	57.0
0.005mm	0.005	9.0	2.7	25.5
0.001mm	0.001	2.9	0.5	10.2
	d50 (mm)	0.8	2.0	0.05

|--|

7.1.2 Sediment Organic Content

The amount of organic content in sediment was measured as total volatile solids (TVS) in the street sediments, catch basins, and catch basin socks. Samples were collected from the street sediment on the north side (n=6) and the south side (n=3), the catch basin sediment collected on the north side (n=11) and the south side (n=11), and from the catch basin socks on the north side (n=1) and the south side (n=1). For each sample event, triplicate samples were tested except for the two sample events when triplicate samples were combined before testing and only one sample was tested (reference Section 6 for more details) and only single samples were collected from the socks due to insufficient sample size to run additional testing.

Results from the TVS testing are summarized in Figure 7.2 and Table 7.2. The organic matter in the catch basins on the south side of the road was 22.0% compared to 18.0% on the north side of the road (combined average of 20.0%). One reason the TVS was slightly higher on the south side of the road is this side is developed with landscaped strips of that are grassed areas adjacent to the road that are frequently mowed by the property owners. It is possible that grass clipping fall onto the road and into the catch basins. The north side of the road has the same landscape strip however this side is undeveloped, and the landscape areas are not maintained. The highest catch basin organic content was measured in October (Table 7.2) which could be due to an increase in hay on the roads as September and October are the primary months for hauling. However, there is insufficient data to draw meaningful conclusions regarding the seasons on the organic content variability.

The TVS of sediment in the catch basins was approximately four times higher than the sediment collected from the street (combined average of 5.2%). This may be due to the hay that builds up on the road and is washed into the catch basins during rainfall events (Figure 3.3). The organic content was highest in the socks (26.0%) however these results are from a small sample size (n=2) and collected from a single sample event (April 2020). Considering the small sample size (n=2) and that the samples were collected from a single sample event (October 2019) it is not possible to draw meaningful conclusions about the catch basin washout organic content.

Organic content results from this study were compared to other studies to assess the comparability of the results to other locations (land use). Few studies were located that reported the organic content of sediment found in streets or catch basins as a function of land use. Two studies that were located were from a Seattle Public Utilities (SPU) study that was similar to this study (SPU, 2009) and a Center for Watershed Protection (CWP) literature review that estimated pollutant removal rates for Street Sweeping and Storm Drain Cleanout Activities (CWP, 2006). Results from these studies and along with this study are summarized in Table 7.3. The street sediment organic content from this study (3.6-6.8%) was about half the content from the SPU industrial sites (9.5%) and three times lower than the residential sites (14%). The CWP study did not report organic content for street sediment. The catch basin sediment organic content from this study (9-31%) was closest to SPU residential sites (17-18%) and within the low end of the industrial sites (28-40%). The CWP catch basins sediment organic content was significantly higher reporting 59% for industrial sites. Compared to the CWP study, the catch basin sediment organic content from this study was within the range for commercial sites (28%) and slightly lower than residential sites (32%). Based on the range of reported data and limited studies reporting TVS or organic content based on land use, it is difficult to assess how the organic content measured during this study
compares to other sites based on land uses. In addition, no studies were found that reported the sediment organic content that washes out of catch basins.



Figure 7.2 Distribution of Organic Content in Catch Basin, Street Sediment, and Catch Basin Socks

Sample Date	CB North n=11	CB South n=11	SS North n=6	SS South n=3	CB Socks North n=1	CB Socks South n=1
4/18/2018	15.3	43.8	-	-	-	-
8/18/2018	29.3	24.7	5.9	-	-	-
4/1/2019	34.2	40.0	-	-	-	-
8/1/2019	10.4	37.4	-	-	-	-
10/1/2019	48.9	56.0	6.3	3.4	-	-
4/24/2020	-	-	-	-	25.0	26.9
Average	18.0	22.0	6.1	3.4	25.0	26.9
Overall Average	20).0	5	.2	26	5.0
Std Deviation	11	.0	1	.6	1	.3

Sediment Collection Location	City of Ellensburg Study	Seattle Pub (SPU,	lic Utilities 2009)	lities Center for Watershed Protection (CWP, 2006)		rotection
Land Use	Light Industrial	Residential	Industrial	Residential	Commercial	Industrial
Street	$5.2\% (3.6-6.8\%)^1$	14%	9.5%	-	-	-
Catch Basin	20% (9-31%) ¹	17-18%	28-40%	32%	28%	59%
Catch Basin Washout	$26\% (24.7-27.3\%)^1$	-	-	-	-	-

Table 7.3. Comparison of Sediment Organic Content (%) Based on Land Use

1. Includes range from standard deviation reported in Table 7.2

7.2 Sediment Accumulation Rate

Objective 2: Quantify the accumulation rate of sediment on the street, in catch basins, and in catch basin socks, without employing street sweeping (control site) and while employing (test site) street sweeping.

Objective 2 was achieved by calculating the sediment accumulation rate on the street, in the catch basins, and in the catch basin socks. The analysis included calculating the sediment dry weight (lbs) using the sediment wet weight (lbs) and moisture content (%) using Equations 1 and 3 from Section 14 of the QAPP. For each sample event, triplicate samples of dewatered sediment were collected and tested for moisture content (except for the two sample events when triplicate samples were combined before testing and only one sample was tested). The sediment accumulation rate was calculated from the total sediment dry weight collected since the last street sweep divided by the number of days since the last sweep. The accumulation rate was normalized to account for slight differences in the contributing basin areas to each catch basin and areas swept (Table 3.2) as well as differences in the duration between street sweeping (sample collection events) area using Equation 3 or 4 from the QAPP Section 14. The results are reported as grams/curb-mile/day for street sediment and grams/catch basin/day for catch basin and washout sediment. Results from each sample locations are summarized in the subsequent sections and detailed results are in Appendix H, I, and K.

7.2.1 Street Sweeping Sediment

The dry weights were calculated for the test side (n=8) and the control side (n=3). The average moisture content and sediment dry weight are reported for each sample event in Table 7.4 and Figure 7.3 provides a comparison of the dry weight calculated from 2018 and 2019. The first sample event occurred in April 2018, six months after both the test and control sides of the street were swept. The test side was swept four times each year (April, June, July, and August) whereas the control side was swept twice in 2018 (April and October) and once in 2019 (October). On the test side the dry weight was highest in April (six months since last sweep) and then the weight had a downward (decreasing) trend for the remaining sweep events that occurred every other month. On the control side, the dry weight was higher compared to the test side for all three events. For the October 2018 and 2019 events the frequency of street sweeping was longer (six and twelve months) compared to the test side (two months). These results consistent with other research which indicates that more frequency street sweeping reduces the quantity of sediment collected on roads (Rochfort, Q., et al., 2009).

Table 7.5 provides a summary of the average dry sediment weight collected each year from the test side and control side. As noted, the total weight of sediment collected was higher (4,648 lbs) from the control side compared to the test side (3,677 lbs) and higher on the south side (4,775 lbs) compared to the north side (3,550 lbs). This maybe because the wind primarily blows from the north west to the south east and is depositing more sediment on the south side of the road (Figure 3.1). In addition, the south side of the road is developed, and more vehicles use the driveway approaches compared to the undeveloped north side. Vehicles are known to contribute to sediment accumulation on streets from tire wear, pavement abrasion, engine break wear, etc. (Minton, 2011).

Data Collection Event	Side of Road	Average Moisture Content (%) ¹	Moisture Content Standard Deviation	Sediment Dry Weight (lbs) ²
A mmil 2019	Test	21.5	NA ³	1,450
April 2018	Control	19.5	NA ³	2,358
June 2018	Test	5.8	0.6	155
August 2018	Test	15.8	0.5	134
Ostalian 2019	Test	19.2	5.6	111
October 2018	Control	10.6	4.3	590
April 2019	Test	15.5	1.7	1,226
June 2019	Test	12.6	10.4	170
August 2019	Test	9.9	2.6	146
October 2010	Test	4.1	0.1	284
October 2019	Control	19.5	3.4	1,700

Table 7.4 Street Sediment Dry Weight Collected During Each Collection Event

1. Average moisture content was calculated using Equation 1 from the QAPP for the study.

2. Sediment dry weight was calculated using Equation 2 from the QAPP for the study.

3. Analytical report included only composite moisture content values for the April 2018 data collection event.



Figure 7.3 Comparison of Street Sediment Dry Weight Collecting during 2018 (left) and 2019 (right) *Note: Hatched bars indicate test side and solid bars indicate control side.*

Side of Road	2018 (lbs)	2019 (lbs)	Total (lbs)
Test	1,850	1,827	3,677
Control	2,948	1,700	4,648
North	1,850	1,700	3,550
South	2,948	1,827	4,775

Table 7.5	Summary	of Drv	Sediment	Weight	Collected
Lable 7.5	Summary	or Dry	Scument	vi cigitt	concercu

The normalized accumulation rate was calculated for the same sample events as the dry weight. These results are summarized in Table 7.6 and Figure 7.4 provides a comparison of the accumulation rate from 2018 and 2019. Similar to the dry weights, the accumulation rates from the test side were highest in April, six months after the last sweep, and then the accumulation rate had a downward trend for the remaining sweep events. The control side (south) had a similar trend for 2018 however for 2019 the accumulation rate for the control side (north side) was similar to the test side despite 12 months since the last sweep compared to 2 months on the test side. These results were not as expected since the frequency of street sweeping is known to reduce the accumulation rate of sediment on roads (Rochfort, Q., et al., 2009). However, the average normalized accumulation rate over the entire study (Table 7.7) was lower on the test side (2,289 g/curb-mile/day) where sweeping occurred eight times during the study compared to the control side (4045 g/curb-mile/day) where sweeping occurred three times over the study. which was expected. These average rates are more consistent with the expected results.

Data Collection Event	Side of Road	Rate of Accumulation (g/d)	Normalized Accumulation Rate (g/lineal mi/d)
A mril 2019	Test	3,355	4,389
April 2018	Control	5,457	7,460
June 2018	Test	1,172	1,534
August 2018	Test	938	1,227
October 2018	Test	811	1,061
	Control	1,431	1,956
April 2019	Test	3,040	4,156
June 2019	Test	1,289	1,762
August 2019	Test	1,016	1,389
Ostober 2010	Test	2,047	2,799
October 2019	Control	2,079	2,719

 Table 7.6 Street Sediment Normalized Accumulation Rate Since Last Sweep



Figure 7.4 Comparison of Normalized Street Sediment Accumulation Rate from 2018 (left) and 2019 (right) *Note: Hatched bars indicate test side and solid bars indicate control side.*

Side of Road	Average Rate of Accumulation (grams/day)	Average Normalized Accumulation (grams/curb-mile/day)
Test	1708.5	2289.5
Control	2988.8	4045.0

Table 7.7 Street Sediment Average Normalized Accumulation Rate Since Last Sweep Over Study Duration

7.2.2 Catch Basin Sediment Weight

The dry weight of sediment collected in catch basins was calculated for the test side (n=8) and the control side (n=8) from samples collected in both 2018 and 2019. The average moisture content and sediment dry weight are reported for each sample event in Table 7.7 and Figure 7.5 provides a comparison of the dry weight calculated from 2018 and 2019. The first sample event occurred each year in April approximately six months following the last sweep and then every two months thereafter until October. For both years, the dry weight on the test side and control side was generally highest in April and then the weight had a downward (decreasing) trend for the remaining sweep events. This was expected since the first sample collection event occurred after six months of accumulation and the other events occurred after only two months of accumulation. Table 7.9 summarizes the total sediment weight collected from the test side (466 lbs) which was higher than the control side (370 lbs) as well as the total sediment weight from the north (383 lbs) and the south (453 lbs). These results are similar to the street sediment in that there is more sediment on the south side compared to the north however unlike the street sediment there was more sediment in the catch basins on the test side compared to the control side.

There are several possible reasons for these results. A property owner on the south side (test side) was observed sweeping sediment into the catch basins during March of year two. The City approached the property owner and the owner agreed to stop. During that discussion, the owner

indicated he had purchased the business since October 2018 (last sweep) and was not aware of the study. The length of road swept by the property owner plus a portion of their shared driveway was estimated to be approximately 550 feet (Figure 7.6). Another reason is that the there was more sediment on the south side of the road as described in Section 7.2.1.

Data Collection Event	Side of Road	Average Moisture Content (%)	Standard Deviation	Sediment Dry Weight (lbs)
April 2019	Test	27.8	NA ³	151
April 2018	Control	22.2	NA ³	131
June 2019	Test	25.9	4.8	27.0
Julie 2018	Control	36.3	11.6	37.0
August 2018	Test	54.4	8.1	18.3
	Control	48.9	11.7	27.7
October 2018	Test	42.7	4.5	51.0
	Control	57.0	8.3	38.2
April 2019	Test	41.8	5.0	88.1
	Control	37.5	7.2	50.2
June 2019	Test	37.8	2.4	55.9
	Control	2.6	0.7	21.5
August 2019	Test	37.4	5.6	42.9
	Control	10.4	6.1	48.0
Ostober 2010	Test	56.0	6.9	32.1
October 2019	Control	48.9	7.2	16.1

 Table 7.7 Catch Basin Sediment Dry Weight Collected During Each Collection Event



Figure 7.5 Comparison of Catch Basin Sediment Dry Weight Collecting during 2018 (left) and 2019 (right) *Note: Hatched bars indicate test side and solid bars indicate control side.*



Figure 7.6 Approximate Location of Street Swept by Property Owner

The normalized accumulation rate was calculated for the same sample events as the dry weight. These results are summarized in Table 7.8 and Figure 7.8 provides a comparison of the accumulation rate from 2018 and 2019. The accumulation rates for both the test side (2018 and 2019) and control side (2018) had a downward trend starting in April and ending in October each year. Whereas the control side during year two (2019) had an increasing trend. For the side of the road where more frequent sweeping is occurring it is anticipated that there would be a decreasing trend in the accumulation rate similar to the test side results. Conversely for the side of the road less frequent sweeping occurring it is anticipated that there would be an increasing trend in the accumulation rate similar to the control side results from 2019. The test side accumulation rate (2018) was highest in April (six months after the last sweep) and October (two months since last sweep). These results were expected for April but not October since theoretically the shorter the duration between street sweeping events the less sediment on the road that could be transferred to the catch basins. During year two (2019) the sediment accumulation rate was higher on the test side (south side) compared to the control side despite the more frequent street sweeping. One reason for these results is that there was more sediment on the south side of the road as described in Section 7.2.1.

Table 7.9 summarized the average normalized accumulation rate over the duration of the study including the average from the test side (north side in 2018 and south side in 2019) and the control side (south side for 2018 and north side for 2019). As noted, the accumulation rate was higher on the test side (16 g/CB/d) compared to the control side (11.7 g/CB/d). These results are the opposite of what was expected since more frequent street sweeping is known to reduce the accumulation rate of sediment on the streets and in theory the sediment that could be transferred to catch basins. SPU conducted a similar study and reported similar results.

		Since last st	treet sweep	Since last (CB cleaning
Data Collection Event	Side of Road	Accumulation Rate (g/d)	Normalized Accumulation Rate (g/CB/d)	Accumulation Rate (g/d)	Normalized Accumulation Rate (g/CB/d)
A	Test	349	22.1	349	22.1
April 2018	Control	302	15.8	302	15.8
Lune 2019	Test	204	12.9	204	12.9
June 2018	Control	279	14.6	279	14.6
August	Test	128	8.1	128	8.1
2018	Control	235	12.2	194	10.1
October	Test	373	23.6	373	23.6
2018	Control	250	13.0	280	14.6
A	Test	218	11.4	218	13.8
April 2019	Control	124	7.9	124	6.5
June 2019	Test	422	22.0	422	26.7
	Control	134	8.5	162	8.5
August 2019	Test	300	15.6	300	19.0
	Control	176	11.1	335	17.5
October	Test	231	12.0	231	14.6
2019	Control	166	10.5	116	6.1

	Table 7.	8 Catch	Basin Sedin	ent Accumulatio	n Rate Since I	Last Collection Event
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Figure 7.8 Comparison of Catch Basin Normalized Accumulation Rate During 2018 (left) and 2019 (right) *Note: Hatched bars indicate test side and solid bars indicate control side.*

	S	ediment Weigl	Since last sweep		
Side of Road	Total (lbs)	2018 (lbs)	2019 (lbs)	Average Rate of Accumulation (g/d)	Average Normalized Accumulation g/CB/d
Test	466	247	219	278	16
Control	370	234	136	208	12
North	383	247	136	207	13
South	453	234	219	280	15

Table 7.9 Catch B	asin Sediment	Average Dry	Weight and Normalized	Accumulation Rate Over Study

7.2.3 Catch Basin Sediment Depth

The average depth of sediment accumulated in catch basins was measured for the test side (n=32) and the control side (n=32) prior to cleaning the catch basins in both 2018 and 2019. The average depth of sediment and standard deviation for each sample event is summarized in Table 7.10 and Figure 7.9 provides a comparison of the depths for 2018 and 2019. The first measurements occurred in April and then every other month thereafter until October each year. For both years, the sediment depth on the test side and control side was highest in April and then the depth had a downward (decreasing) trend for the remaining sample events. This was expected since the first sample collection event occurred after six months of accumulation and the other events occurred after only two months of accumulation. The first test side (south) depth measurement in 2019 was more than double the control side (north) despite both sides being sweep in October 2018. This maybe because of the property owner was sweeping sediment into the catch basins (Section 7.2.2).

Data Collection Event Side of Road		Average Depth of Sediment (in.)	Standard Deviation
April 2019	Test	3.20	0.06
April 2018	Control	3.18	0.11
Juna 2019	Test	0.94	0.05
Julie 2018	Control	1.11	0.11
August 2019	Test	0.73	0.04
August 2018	Control	0.38	0.08
October 2018	Test	0.54	0.03
Octobel 2018	Control	0.55	0.06
April 2010	Test	3.30	0.10
April 2019	Control	1.41	0.05
Juna 2010	Test	0.58	0.06
Julie 2019	Control	0.12	0.03
August 2010	Test	0.64	0.07
August 2019	Control	0.88	0.05
October 2010	Test	0.55	0.07
October 2019	Control	0.23	0.03

 Table 7.10 Catch Basin Sediment Depth Recorded During Each Collection Event



Figure 7.9 Comparison of Catch Basin Sediment Depth During 2018 (left) and 2019 (right) *Note: Hatched bars indicate test side and solid bars indicate control side.*

The normalized accumulation rate was calculated for the same sample events as the depth. These results are summarized in Table 7.11 and Figure 7.10 provides a comparison of the accumulation rate from 2018 and 2019. The accumulation rates for the test side and control side (2018 and 2019) had a downward (decreasing) trend starting in April and ending in October each year. For the side of the road where more frequent sweeping is occurring it was expected that there would be a decreasing trend in the accumulation rate similar to the test side results. Conversely for the side of the road less frequent sweeping occurring it is anticipated that there would be an increasing trend in the accumulation rate over the duration of the study. Table 7.9 summarized the average normalized accumulation rate over the duration of the study including the average from the test side (north side in 2018 and south side in 2019) and the control side (south side for 2018 and north side for 2019). As noted, the accumulation rate was higher on the test side (0.00028 g/CB/d) compared to the control side (0.00024 g/CB/d). These results are the opposite of what was expected since more frequent street sweeping is known to reduce the accumulation rate of sediment on the streets and in theory the sediment that could be transferred to catch basins. These results are consistent with the catch basin sediment accumulation rates results described in Section 7.2.2.

		Since last street sweep	Since last CB cleaning	
Data Collection Event	Side of Road	Normalized Accumulation Rate (in/CB/d)	Normalized Accumulation (in/CB/d)	
A mril 2019	Test	0.00036	0.00036	
April 2018	Control	0.00037	0.00037	
June 2019	Test	0.00035	0.00035	
June 2018	Control	0.00043	0.00043	
August 2018	Test	0.00025	0.00025	
	Control	0.00027	0.00013	
October 2019	Test	0.00019	0.00019	
October 2018	Control	0.00025	0.00021	
A mril 2010	Test	0.00041	0.00041	
April 2019	Control	0.00017	0.00017	
June 2010	Test	0.00023	0.00023	
June 2019	Control	0.00014	0.00004	
August 2019	Test	0.00023	0.00023	
	Control	0.00017	0.00030	
October 2010	Test	0.00020	0.00020	
October 2019	Control	0.00016	0.00008	

Table 7.11	Catch Basin	Depth Accum	ulation Rate	Since Last C	Collection Event
I ubic / III	Cutten Dubin	Depth Meeum	unation mate	Since Lust C	Joneenon Litent



Figure 7.10 Comparison of Normalized Catch Basin Accumulation Depth During 2018 (left) and 2019 (right) *Note: Hatched bars indicate test side and solid bars indicate control side.*

	Average Normalized Accumulation Rate (in/CB/d)	
Side of Road	Since Last Street Sweep	
Test	0.00028	
Control	0.00024	

Table 7.12 Catch Basin De	pth Average Accumulation	Rate Over Study Duration

7.2.4 Catch Basin Sock Sediment

The dry weight of sediment collected in catch basins socks was calculated for the test side (n=24) and the control side (n=25) from samples collected in both 2018 and 2019. The first sample event occurred in June (2018) and April (2019) and then every other month thereafter until October each year. For each sample event there are seven socks, four on the north and three on the south. There is one less on the south because one of the catch basins does not discharge to swale. The average sediment dry weight and standard deviation are reported for each sample event in Table 7.13 and Figure 7.11 provides a comparison of the dry weight calculated from 2018 and 2019. As noted in the Table 5.2 footnotes, the sock collected in April 2019 were lost in a laboratory fire. Socks were installed in October 2019 and removed in April 2020 that are included in this section as data from April 2019. The April 2020 socks were considered representative of the April 2019 socks since the same street sweeping and catch basin practices were followed as the previous year.

For both years, the dry weight on the test side and control side was generally highest in April and then the weight had a downward (decreasing) trend for the remaining sweep events. This was expected since the first sample collection event occurred after six months of accumulation and the other events occurred after only two months of accumulation. The one exception was from the control side in August 2019 which may be due to a high intensity rainfall event that occurred just before the sample collection event (Section 7.3). Table 7.14 summarizes the total weight collected in the socks from the test side (3696 grams) was lower compared to the control side (4078 grams) as well as the north side (3982 grams) and control side (4078 grams). These results suggest that less sediment was washed out of the catch basins on the side of the street with more frequent street sweeping.

Sample Collection Month	Side of Road	Average Sediment Dry Weight ¹ (g)	Standard Deviation
June 2019 ¹	Test 159		0.29
June 2018	Control	219	0.49
August 2019	Test	16.0	0.01
August 2018	Control	19.1	0.02
October 2019	Test	79.8	0.15
October 2018	Control	34.3	0.11
$A mil 2010^2$	Test	NA	NA
April 2019	Control	NA	NA
June 2010	Test	70.0	0.28
Julie 2019	Control	121	0.40
August 2010	Test	539	0.36
August 2019	Control	350	0.76
October 2018	Test	173	0.11
October 2018	Control	87.3	0.17

1. Sediment dry weight was provided by the analytical laboratory, following drying of the socks in an oven.



Figure 7.11 Comparison of Catch Basin Sock Sediment Dry Weight Collected in 2018 (left) and 2019 (right) *Note: Hatched bars indicate test side and solid bars indicate control side.*

The normalized accumulation rate was calculated for the same sample events as the dry weight. These results are summarized in Table 7.14 and Figure 7.12 provides a comparison of the accumulation rate from 2018 and 2019. The accumulation rates for the test side (2018) and the control side (2018 and 2019) had a downward trend starting in April and ending in October. Whereas the test side during year two (2019) had an increasing trend. If street sweeping can influence sediment washout from catch basins, the side of the road where more frequent sweeping is occurring would have a decreasing trend in the sediment accumulation rate because there is less sediment on the road that could get transferred to and potentially washed out of the catch basins. Conversely for the side of the road with less frequent sweeping occurring there would be an increasing trend in the sediment accumulation rate because there is more sediment on the road that could get transferred to and potentially washed out of the road that could get transferred to and potentially washed on the road that could get transferred to and potentially washed out of the road that could get transferred to and potentially washed out of the road that could get transferred to and potentially washed out of the road that could get transferred to and potentially washed out of the road that could get transferred to and potentially washed out of the road that could get transferred to and potentially washed out of the road that could get transferred to and potentially washed out of the road that could get transferred to and potentially washed out of the road that could get transferred to and potentially washed out of the catch basins. Only the results from the 2018 test side are consistent with this theory.

Research conducted by others has reported that washout of sediment from catch basins is more likely to occur once the catch basin sump is 60% full (Tetra Tech, 2001). For this study, the maximum measured sediment depth was 3.2-inches which is lower than the 16-inch at 60% of the sump depth. No research was located that evaluated the influence of street sweeping on sediment washout from catch basins when the depth is lower than 60%. Considering the mixed results from this study, the low sediment depth in the catch basins, and no other studies for comparison, more research is needed to determine if street sweeping can influence the rate of sediment washout from catch basins.

Other factors may influence of the washout of sediment from catch basins. Research conducted by others indicates that the density and particle size distributions most affect the transport of the solids in stormwater. Larger particles in storm water tend to settle out (on the road or in catch basins), whereas smaller particles remain suspended in storm water and can be washed out (Characklis & Wiesner, 1997). Hydraulics can also influence sediment transport for example a high intensity rainfall events has a higher force compared to a rainfall event with the same depth that occurred over a longer duration) for moving larger and more sediment (Minton, 2011). This may explain the highest sediment weight and accumulation rate which was measured in August 2019 following a high intensity event in Ellensburg (Section 7.3).

Table 7.9 summarized the average normalized accumulation rate over the duration of the study including the average from the test side (north side in 2018 and south side in 2019) and the control side (south side for 2018 and north side for 2019). As noted, the accumulation rate was higher on the test side (0.64 g/CB/d) compared to the control side (0.40 g/CB/d). These results are consistent with the catch basin sediment dry weight accumulation rates in catch basins (Section 7.2.2) and the sediment depth accumulation rate (Section 7.2.3) on the test and control side. The higher rate of washout from the test side maybe due to a higher quantity of sediment in the catch basins on the test side.

		Since la	st sweep	Since last CB clean		
Sample Collection Date	Side of Road	Rate of Accumulation (g/d)	Normalized Accumulation (g/lineal mi/d)	Rate of Accumulation (g/d)	Normalized Accumulation (g/lineal mi/d)	
Jun 19	Test	2.31	0.63	2.31	0.63	
Juli-18	Control	3.66	0.99	3.66	0.99	
A	Test	0.25	0.07	0.25	0.07	
Aug-18	Control	1.92	0.52	0.30	0.08	
Ort 19	Test	1.29	0.33	1.31	0.34	
001-18	Control	1.46	0.40	0.55	0.15	
Apr-19	Test	-	-	-	-	
	Control	-	-	-	-	
L = 10	Test	1.17	0.32	1.17	0.32	
Jun-19	Control	0.50	0.14	2.02	0.56	
A 10	Test	8.42	2.33	8.42	2.33	
Aug-19	Control	1.14	0.29	5.46	1.38	
0 / 10	Test	2.75	0.76	2.80	0.77	
Oct-19	Test	0.24	0.06	1.41	0.37	
Apr-20	Test	1.18	0.32	1.19	0.33	
	Control	1.45	0.39	1.46	0.39	
L = 10	Test	2.31	0.63	2.31	0.63	
Jun-18	Control	3.66	0.99	3.66	0.99	





Figure 7.12 Comparison of Catch Basin Sock Normalized Accumulation Rate in 2018 (left) and 2019 (right) *Note: Hatched bars indicate test side and solid bars indicate control side.*

		Since last sweep		
Side of Road	Sediment Weight (g)	Average Rate of Accumulation (g/d)	Average Normalized Accumulation (g/CB/d)	
Test	3696	2.32	0.64	
Control	4078	1.48	0.40	
North	3982			
South	4078			

|--|

7.3 Weather Data

Objective 3: Identify potential weather-related methods of sediment transport to the road, catch basin, and catch basin socks and assess representativeness of the climate conditions during the study (compared to historical records)

Objective 3 was achieved by collecting and evaluating weather data (precipitation and wind) from a weather station (Section 5.2.1) near the test site. Appendix L contains a copy of the raw weather data. This section provides a summary of the data along with discussion regarding the weather during the study, specifically representativeness (compared to historical weather in Ellensburg) and the potential influence on sediment transport.

7.3.1 Representativeness of Weather During the Study

The historical precipitation depth by month is shown in Figures 7.13-7.15 along with the precipitation depth measured during this study. These precipitation depths include the measured rainfall depths as well as the rainfall equivalent depth of snow fall. The historical precipitation depth for Ellensburg is 9-inches and during this study the measured precipitation depth was slightly lower at 7.09-inches and 7.32-inches. Runoff from precipitation is known to transport sediment to catch basins particularly solids less than 0.25 mm (Fan, 2004; Tang, 2016). Based on the monthly averages during the study, it is anticipated that there was slightly less sediment transported to the catch basins during this study compared to a typical year with historical precipitation depths.

The historical wind speed (average and maximum monthly) in Ellensburg is shown Table 7.15 and Figures 7.13-7.15 along with the measured values during this study. The average wind speed measured (April 2018 to April 2020) was slightly lower compared to historical (4.8 mph compared to 9.0 mph) however the average maximum wind speed was about the same (15.1 compared to 15.5 mph). Wind is known to convey sediment into catch basins (solids less than 5 mm) and even influence sediment washout (smaller solids) from catch basins (Fan, 2004). The lower average wind speed may have reduced the transport of sediment to catch basins.



Figure 7.13 2018 Precipitation During Study vs. Historic Average Precipitation



Figure 7.14 2019 Precipitation During Study vs. Historic Average Precipitation



Figure 7.15 2020 Precipitation During Study vs. Historic Average Precipitation



Figure 7.16 2018 Average Monthly Wind vs. Historic Averages



Figure 7.17 2019 Average Monthly Wind vs. Historic Averages



Figure 7.18 2020 Average Monthly Wind vs. Historic Averages

	Wind Speed (mph)					
	Year 1 Year 2 Overall Historical					
Average	4.4	5.3	4.8	9.0		
Maximum	13.6	16.5	15.1	15.5		

Table	7.15.	Com	parison	of	Wind	Speed	Measured	vs.	Historical	l

7.3.2 Potential Influence of Weather on Study Results

The measured precipitation data and maximum wind speed were compared to the data from the sample collection events to assess the potential influence of precipitation and wind on the sediment accumulation rate. Figure 7.19 displays the cumulative precipitation depth since the last catch basin cleaning compared to the sediment depth measured in the catch basins. As shown higher precipitation depth are generally associated with higher sediment depths. These results suggest precipitation events likely influenced the transport of sediment to catch basins. One exception is the August 2018 sample collection event when there was only 0.01-inches of rainfall since the last catch basin cleaning but there was still a measurable depth of sediment in the catch basins. Since wind is known to transfer sediment to catch basins, and the wind speed is highest in Ellensburg during the dry season (Figure 7.20), wind likely contributes to sediment transport to the catch basins. This further support the theory previously mentioned regarding wind being responsible for higher sediment loads on the south side of the road were compared to the north side (wind blows from the north west to the south east). Figure 7.20 displays the average monthly maximum wind speed compared to the sediment depth measured in the catch basins.

Sediment movement in urban areas to storm sewer systems can occur through wind and stormwater runoff. Reportedly wind can transport solids less 5 mm in size whereas solids in runoff are typically less than 0.25 mm (Fan, 2004). Limited research was located on regarding wind transporting solids to catch basins and into the storm drain system. As such it is not possible to estimate the fraction of sediment transported to catch basins compared to transport via runoff beyond what has been discussed and can be observed in Figures 7.19 and 7.20. Sediment transport through runoff is well documented and a complicated process. Sediment wash off from imperious surfaces is influenced by the rainfall energy, rainfall intensity, runoff volume, and surface characteristics such as topography. For sediment that has collected on roadway surfaces, sediment transport occurs after the runoff energy (velocity of runoff) exceed the critical shear stress of solids (Yang, 2016; Navickis-Brasch, 2011). For high intensity rainfall events, sediment transport is more likely to occur compared to long duration rainfall events with the same precipitation depth because runoff has less energy. This may explain why the sediment depth was higher compared to the cumulative precipitation in August 2019 (Figure 7.20 and 7.22). A few weeks prior to the August 2019 sample collection event, a high intensity rainfall event occurred (0.35 in. in one day). This high intensity rainfall event may also explain why the catch basin sock accumulation rate was highest in August 2019. Figures 7.20 to 7.22 displays the measured monthly precipitation depth along with the daily precipitation depth and the days sample collection occurred.



Figure 7.19 Sediment Depth Measured in Catch Basins and Precipitation Since Last Data Collection Event



Figure 7.20 Sediment Depth Measured in Catch Basins and Average Monthly Maximum Wind Speed







Figure 7.22 2019 Precipitation & Monitoring Events



Figure 7.23 2022 Precipitation & Monitoring Events

7.4 Statistical Comparison of Datasets

Objective 4: Determine whether there is a statistically significant difference between the sediment accumulation rate in the catch basins and in the catch basin socks (washout from the catch basin) at the test site compared to the control site

Objective 4 was achieved by conducting a statistical analysis to assess whether there was a significant difference in the sediment accumulation rate between datasets. This included evaluating whether the data was normally distributed using the Ryan-Joiner test (similar to Shapiro-Wilk test) (Helsel & Hirsch, 2002). Normality was assumed if the tests produced a p-value greater than 0.05 (Ecology, 2008). If the data was normally distributed, a two-sample t-test was used to determine if there was a significant difference between the sediment accumulation at the test site and the control site. If the data was non-normally distributed, a Wilcoxon rank sum test (a nonparametric analogue to the paired t-test) was used instead. The specific null hypothesis (Ho) and alternative hypothesis (Ha) that were evaluated is defined below. The statistical comparison will be based on a confidence level of 95% (α =0.05). Appendix P contains the full results from the normality and statistical analysis.

Hypothesis 1:

- H_o: The sediment accumulation rate on the street during year one at the test site is equal to the sediment accumulation rate on the street at the test site during year two
- H_a: The sediment accumulation rate on the street during year one at the test site is not equal to the sediment accumulation rate on the street at the test site during year two

Hypothesis 2:

- Ho: The sediment accumulation rate in the catch basins at the test site is equal to the sediment accumulation in the catch basins at the control site
- Ha: The sediment accumulation rate in the catch basins at the test site is not equal to the sediment accumulation in the catch basins at the control site

Hypothesis 3:

- Ho: The sediment accumulation rate in the catch basin socks at the test site is equal to the sediment accumulation in the catch basins socks at the control site
- Ha: The sediment accumulation rate in the catch basin socks at the test site is not equal to the sediment accumulation in the catch basin socks at the control site

7.4.1 Hypothesis 1: Street Sediment Accumulation Rate

Both a two-sample t-test and the Wilcoxon rank sum test were used to assess the significant difference in the street sediment accumulation rate between on the test side between year one (n=4) and year two (n=4). This is because the results of the normality testing indicate the data collected from year one was non-normally distributed (p<0.05) whereas the data collected from year two was normally distributed (p>0.05). Results from the t-test and Wilcoxon test indicate that the difference in the street sediment accumulation rate between the two years was statistically insignificant (p=0.656 and p=0.47 respectively). These results suggest that the distribution of street sediment between the test side during year one (average 2,053 g/lineal-mile/day) was equivalent (statistically insignificant) compared to the test side during year two (average 2527 g/lineal-mile/day).

7.4.2 Hypothesis 2: Catch Basin Sediment Accumulation Rate

A two-sample t-test was used to assess the significant difference in the catch basin sediment accumulation rate between the test and control side. This is because the results of the normality testing indicate the data collected from both sides was normally distributed (p>0.05). Results from the t-test indicate that the difference in the catch basin sediment accumulation rate between the test side (average 16.0 grams/catch basin/day) and control side (11.7 grams/catch basin/day) was statistically insignificant (p=0.095). These results suggest that the frequency of street sweeping did not influence the accumulation of sediment in the catch basins.

7.4.3 Hypothesis 3: Catch Basin Sock Sediment Accumulation Rate

A two-sample t-test was used to assess the significant difference in the catch basin sock sediment accumulation rate between the test (n=6) and control side (n=7). This is because the results of the normality testing indicate the data collected from the test side was normally distributed (p>0.05). Results from the t-test indicate that the difference in the catch basin sock sediment accumulation rate between the test side (average 0.64 grams/sock/day) and control side (average 0.40 grams/sock/day) is statistically insignificant (p=0.961). These results suggest that the frequency of street sweeping did not influence sediment accumulation that washed out of the catch basins socks.

Note: the sample size is not the same because one data point was removed after running the Grubb's Test and being identified as an outlier. Reference Appendix P for the outlier results.

8.0 Recommendations and Transferability

Data collected from the study was used to recommend a combination of street sweeping and catch basin cleaning procedures for achieving permit requirements for catch basin cleaning. Section 8.1 provides a summary of the recommendations and the process used to develop the recommendations. Section 8.2 provides an overview and discussion regarding the variables that may influence the transferability of the recommendations to other sites.

8.0 Relationship between Street Sweeping and Catch Basin Cleaning

Objective 5: Evaluate whether there is a correlation (using a regression analysis) between catch basin sediment accumulation rates and street sweeping frequency that could be used to develop a schedule for catch basin cleaning and provide recommendations for applying the results.

Objective 5 was achieved by using data collected from the study to develop a relationship between street sweeping frequency and catch basin cleaning. Results from the analysis are shown in Figure 8.1 and the analysis methods are described in later in this section. The x-axis is the frequency of street sweeping each year that occurs at regular intervals during the dry season. The y-axis is the recommended schedule for cleaning catch basins which is based on the estimated time it would take for sediment to fill 60% of the catch basin sump. A linear least squares regression analysis was used to evaluate the relationship between street sweeping frequency and the time it would take for the catch basin sump to fill (60% full) and the results indicate a strong linear correlation (R^2 =0.9354). An example of how Figure 8.1 could be used is if the City decides to sweep four times per year, it is estimated that the catch basins would need to be cleaned every ~7.5 years. These recommendations are specific to the site where the study was conducted. Section 8.2 provides a discussion regarding the transferability of this information to other locations.



Figure 8.1 Recommend Catch Basin Cleaning Frequency based on Frequency of Street Sweeping

The process of developing the graph is as follows:

- The depth of sediment measured in the catch basins was graphed against the weight of sediment collected during each sample collection event from both the test side and control side. A correlation between the data points was established using a linear least squares regression (trendline equation on Figure 8.1). A few outliers were identified using Grubbs Test and removed.
- The sediment depth vs weight (trendline) equation was used to estimate the dry weight (139 lbs) when the catch basin would be 60% of the sump depth. These results were considered conservative since the density of the sediment will increase as the sediment depth increases due to the weight of the sediment.
- The bulk density of sediment collected from the catch basins (n=6) in October 2019 was measured at 80% compaction (36.83 lb/ft³). No studies were found that report catch basin sediment density at varying depths, so the compaction was estimated from related studies. Specifically, the average compaction of dry sand that is poured into a container is 85% (Muszynski, 2006). The catch basin sediment from this study has a 20% organic content and bulk density reportedly decreases as the organic content increases (Avnimelech, Y., Ritvo, G., Meijer, L. E., & Kochba, M., 2001). Considering that, compaction was adjusted to 65% to estimate the sediment density in the catch basins (29.9 lb/ft³) at 60% full.
- The weight of the sediment at 60% sump depth (289 lbs) was calculated from the catch basin sump volume at 60% full (5.5cft) times the assumed density (27.6 lb/ft³). Considering the weight calculated from the bulk design at 60% compaction is twice the weight using the trendline equation (289 lbs compared to 139 lbs), the trendline equation method appears to be conservative providing a factor of safety of approximately 2.
- For each sample collection event, the average weight of sediment measured in the catch basin was divided by the estimated weight at 60% full using the trendline equation (139 lbs) to estimate how many years it would take to fill the catch basin to 60% the sump depth. The number of years to fill was plotted vs the number of sweeps per year that occurred when that sample was collected (Figure 8.1).



Figure 8.11 Catch Basin Sediment Depth vs. Catch Basin Sediment Weight

8.2 Considerations for Transferability of Recommendations

Figure 8.1 is intended to provide the City of Ellensburg with recommendations for scheduling catch basin cleaning based on the frequency of street sweeping. These recommendations are specific to the site were the study was conducted. A literature review was conducted to identify site specific conditions (variables) that may influence the transferability of these recommendations. If the Figure 8.1 recommendations are considered for a different site, then the cumulative impact of all the conditions described in this section should be evaluated to develop modified recommendations for that specific site.

Sediment accumulation rates in catch basins are influenced by many variables. These variables include land use and traffic volumes; weather (rainfall energy, rainfall intensity, runoff volume, wind); topography; particle size; whether or not street parking is permitted; and the presence of trees; and winter maintenance practices (Tang, 2016; Milesi, 2013; Minton, 2011; Tan, 2006; Caraco et al., 2000). The remainder of the section provides a summary of these variables along with discussion regarding how the presence of these variables may influence the transferability of this studies results to another site:

- Land Use Multiple research studies have reported significantly different sediment accumulation rates based on land use. Industrial areas reportedly have the highest accumulation rates compared to commercial or residential areas (Milesi, 2013; Minton, 2011; Stein, 2006; Maestre & Pitt, 2007). Conflicting results were reported with commercial and residential areas with some studies reporting higher accumulation rates in residential areas (Stein, 2006) whereas other studies reported higher accumulation rates in commercial areas (Maestre & Pitt, 2007). One reason for the differences is more frequent street sweeping may occur in some commercial areas by property owners (compared to residential or industrial areas) that are not reported in the literature (Minton, 2012). Another reason is some studies report results for all residential land use designations combined whereas other studies provide more detailed categories such as low density (one dwelling unit per acre) and high density (sixteen dwellings units per acre). Reportedly low-density residential designations have higher sediment accumulation rates compared to high density residential (Barret, 1996; Stein, 2006) and heavily traveled commercial streets have two to three times higher accumulation rates compared to high density residential (Milesi, 2013). Before distinguishing potential differences in sediment accumulation rates between commercial and residential areas, a more detailed literature search is needed to evaluate the variables that may influence these differences. Transferability Consideration: The test site for this study is located in a light industrial area and sediment accumulation rates are likely higher compared to commercial or residential areas. As such the frequency of street sweeping and/or catch basin cleaning could be reduced compared to Figure 8.1 recommendations for roads in residential or commercial as it would likely take longer for the catch basins to reach 60% full.
- **Traffic Volumes** Conflicting results have been reported with respect to the influence of traffic volumes on sediment accumulation rates. Researchers have reported that sediment accumulation rates increase with traffic volumes for average daily traffic (ADT) counts between 4,500 to 20,000 (Viklander, 1998; zero to 50,000 (Shaheen, 1975), and up to 30,000 (Strecker et al., 1990). Whereas a four-year study conducted by CalTrans at 83 sites with varying ADTs (2,600 to 328,000) found that sediment accumulation rates (n=809) for

non-urban roads (ADT<30,000) were more the twice urban roads (ADT>30,000). In the same study that researcher indicated they reviewed several studies and found that all reported no or weak correlations between ADT and sediment accumulation rates (Kayhanian, 2003). *The reported ADT for this study is 4,000. For sites with ADTs 30,000 or less, there may be an increase in sediment accumulation rates as ADT increases. As such for sites with ADTs higher than 4,000 the frequency of street sweeping and/or catch basin cleaning should be increased compared to Figure 8.1 recommendations to account for additional sediment accumulation.* However, a more detailed review of literature is recommended to better understand the relationship between ADT and sediment accumulation rates. Results from the literature search could be used to expand the Figure 8.1 recommendations to include ADT.

- **Topography** The test site for this study had a relatively flat topography (3%). Runoff energy tends to increase as the site slope increases, transporting more sediment to catch basins. For sites with higher slopes (>3%), the frequency of street sweeping and/or catch basin cleaning should be increased compared to Figure 8.1 recommendations to account for additional sediment accumulation. Conversely sites with lower slopes (<3%) may be able to use a decreased frequency.
- Wind Wind can influence the quantity of sediment transported to catch basins (Section 7.3). The average and maximum historical wind speed at the study site was 9.0 mph and 15.5 mph respectively. For sites with lower average wind speeds, the Figure 8.1 recommendations may be conservative and the frequency of street sweeping and/or catch basin cleaning could be reduced. A more detailed literature search or research is needed to better understand the relationship between wind speed and the fraction of sediment (by particle size) that is transported to catch basins.
- **Rainfall Characteristics** Rainfall intensity and volume can influence the rainfall energy available to transport sediment to catch basins. The mean annual precipitation (MAP) in Ellensburg is 9-inches of which an average of 3-inches occurs during the dry season (Section 7.3.1). In addition, short duration high intensity rainfall events are common during the dry season (Section 3.2). For sites with higher MAP *the frequency of street sweeping and/or catch basin cleaning in Figure 8.1 should be increased to account for potentially higher sediment accumulation rates.*
- Sediment Particle Size The sediment PSD can influence sediment transport via runoff and wind. Before applying these results to other locations, PSD on the streets should be tested and compared to the data in Section 7.1.1. *If the d50 is larger than it was for this study, the recommendations in Figure 8.1 maybe conservative as it will take more energy (from wind or runoff) to transfer sediment. Conversely, if the d50 is smaller the recommendations may need to be adjusted to include more frequent street sweeping and/or catch basin cleaning because it will take less energy to transfer sediment to catch basins.*
- Sediment Organic Content The organic content of sediment in catch basins can influence the sediment bulk density and subsequently the time it will take the catch basin to fill 60% of the sump. Specifically, the higher the organic content, the lower the bulk density of sediment in catch basins. The test site for this study was is a major hay hauling route which may have influenced the catch basin organic content (20%). *If the organic content is higher at a site compared to this study the bulk density will be lower than this study and the recommended frequency of street sweeping and catch basin cleaning may need to be increased (weight to fill catch basin would be less).* There was limited research

located that provided a range of TVS or organic content based on land use, as such it is difficult to assess how the organic content measured during this study compares to similar land uses. In addition, no studies were found that reported the sediment organic content that washes out of catch basins. Future research is recommended to identify a range of organic contents based on land use or test the organic content at specific sites before applying the results from this study.

- Street Parking Street parking can influence the street sweepers effectiveness for reducing sediment accumulation especially in locations that are known to problems with people not moving their vehicle when sweeping is scheduled. The study site did not permit vehicles to park on the street at any time. *If street parking is permitted at a site the there the recommended frequency of street sweeping and catch basin cleaning should be increased.*
- **Trees** Leaves and pine needles that fall onto streets and are not immediately cleared are known to clog storm drains and also contribute to sediment accumulation rates. This study was conducted on a street without trees. *If the deciduous or evergreen trees are present at a site the recommended frequency of street sweeping and catch basin cleaning should be increased during the season leaf or pine needle fall is expected.*
- Winter Maintenance Practices In cold climate locations, sediment accumulation rates may be higher if winter maintenance practices include applying sand to roads. The test site for this study did not include applying sand. *If the sand is applied at a site the recommended frequency of street sweeping and catch basin cleaning should be increased.*

9.0 Conclusion

Objective 6: Summarize the study results. This objective was achieved by summarizing the results in this section.

The goal of this study was to determine whether the frequency of street sweeping significantly reduces the rate of sediment accumulation in catch basins (and transported from catch basins) during the dry season in a semi-arid location. While there was generally a decreasing trend in the sediment accumulation rate in catch basins and catch basin socks (washout) as the frequency of street sweeping increased, the differences between the test side and control side were statistically insignificant. These results suggest that frequency of street sweeping performed within this study does not significantly reduce the rate of sediment accumulation in catch basins (and transported from catch basins). However, that does not mean that more frequent street sweeping does not have a significant effect on catch basin sediment accumulation rates. It just means the results from this study did not prove a significant difference.

Similar street sweeping and catch basin studies have been conducted and many researchers have reported results similar to this study noting that extreme variability in site conditions can influence the results such as wind, sediment loading, rainfall patterns, etc. (SPU, 2009; USGS, 2007; CWP, 2006; Caraco, 2000). For example, a high intensity rainfall event right before sample collection (reference August 2019 on Figure 7.22) can influence the results for a study with a small sample size like this study. One approach to control some variability might be to design a similar study except that street sweeping would occur right before rainfall events. This could eliminate some of the rainfall variability however it would be challenging because the street sweeping schedule would be based on the weather forecast which is not always accurate. In addition, this type of approach does not reflect world conditions. Another approach for studies with high variability is to collect significantly more data which is needed to detect significant differences from street sweeping (USGS, 2007; CWP, 2006; Kalinosky, et.al; 2014).

More frequent street sweeping during the dry season should be more effective in semi-arid regions that have distinct wet and dry seasons (Caraco, 2000). Low annual rainfall, droughts, high evaporation rates, and high intensity rainfall events are all characteristics of semi-arid locations. Ellensburg's mean annual precipitation is 9-inches of which 25% is from snow (22-inches) and 67% of the precipitation occurs between October and March. During the dry season (April to October) in a semi-arid location such as Ellensburg, rainfall events are less frequent and may not produce enough runoff energy to transfer a significant amount of sediment to catch basins unless there is a high intensity rainfall event. As such more frequent sweeping throughout the drier season can reduce the sediment accumulation on roads, which will reduce the sediment that could be transferred catch basins during the wet season (Caraco, 2000).

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11.0 Appendices

Appendix A Survey Data



Appendix B Raw Lab Data
April 2018 Data Collection Event



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Spokane 11922 East 1st Ave Spokane, WA 99206 Tel: (509)924-9200

TestAmerica Job ID: 590-8467-1

Client Project/Site: City of Ellensburg Effectiveness Study

For:

HDR Inc 1401 E. Trent Ave Suite 101 Spokane, Washington 99202

Attn: Aimee Navickis-Brasch

tardue trington

Authorized for release by: 5/18/2018 3:52:43 PM

Randee Arrington, Project Manager II (509)924-9200 randee.arrington@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

Job ID: 590-8467-1

Laboratory: TestAmerica Spokane

Narrative

Receipt

The samples were received on 5/2/2018 10:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6° C.

Receipt Exceptions

The Chain of Custody was received without any analyses selected. The samples were logged in per the sample IDs and confirmed by the client.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Geotechnical

Method D422: The following samples contained large amounts of grass: Basin 1 (590-8467-1) and Basin 3 (590-8467-3). This method was not designed for these types of samples therefor data may be considered as estimates only. Hydrometer was not able to float freely to give accurate reading. Root balls do not break up with the roto-taper and may hold onto smaller grain sizes.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study TestAmerica Job ID: 590-8467-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	
590-8467-1	Basin 1	Solid	05/01/18 10:30	05/02/18 10:55	Δ
590-8467-2	Basin 2	Solid	05/01/18 10:30	05/02/18 10:55	-
590-8467-3	Basin 3	Solid	05/01/18 10:30	05/02/18 10:55	5
590-8467-4	Basin 4	Solid	05/01/18 10:30	05/02/18 10:55	J
					8
					9

TestAmerica Spokane

Definitions/Glossary

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

1 2 3 4 5 6 7 8 9

Qualifiers

Geotechnical

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study TestAmerica Job ID: 590-8467-1

Client Sample ID: 050118CB Date Collected: 05/01/18 10:30 Date Received: 05/02/18 10:55	TS-1	CB-TS					Lab Samı	ole ID: 590-8 Matrix	8467-1 c: Solid
Method: D2216-90 - Water (Mo	isture) Con	itent							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	27.8		0.01		%			05/14/18 14:48	1
Method: D2974 - Moisture, Ash	n and Orga	nic Matter							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Loss on Ignition	15.3		1.0		%			05/09/18 07:15	1
Method: D422 - Grain Size									
Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analvzed	Dil Fac
Gravel	7.5				%			05/15/18 09:21	1
Coarse Sand	12.2				%			05/15/18 09:21	1
Medium Sand	36.2				%			05/15/18 09:21	1
Fine Sand	22.9				%			05/15/18 09:21	
Silt	15.8				%			05/15/18 09:21	1
Clay	5.0				%			05/15/18 09:21	1
					70			03/13/10 09.21	1
Client Sample ID: 050118SS	TS-1						Lab Sam	ole ID: 590-8	8467-2
Date Collected: 05/01/18 10:30		SS-TS						Matrix	c: Solid
Date Received: 05/02/18 10:55									
Method: D2216-90 - Water (Mo	isture) Con	itent							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	21.5		0.01		%			05/14/18 14:48	1
Client Sample ID: 050118CB	BCS-1						l ah Sami	Je ID: 590-8	467-3
Data Collected: 05/01/19 10:20								Motrix	
Date Conected: 05/01/16 10:30	CE	B-CS						watro	c. 50110
Date Received: 05/02/18 10:55									
Method: D2216-90 - Water (Mo	isture) Con	itent							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Moisture Content	232.3	· · · · · · · · · · · · · · · · · · ·	0.01		%		•	05/14/18 14:48	1
Method: D2974 - Moisture Ask	and Orga	nic Mattor							
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Loss on Ignition	43.8		1.0		%			05/09/18 07:15	1
Method: D422 - Grain Size									
Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gravel	7.6				%			05/15/18 09:21	1
Coarse Sand	3.9				%			05/15/18 09:21	1
Medium Sand	17.5				%			05/15/18 09:21	1
Fine Sand	27.3				%			05/15/18 09:21	1
Silt	6.8				%			05/15/18 09:21	1
Clay	36.9				%			05/15/18 09:21	1
Client Sample ID: 05011889	<u>28-1</u>						l ah Sami		RA67 A
Dete Collected: 05/04/40.40:00		SS-CS				I			······
Date Collected: 05/01/18 10:30 Date Received: 05/02/18 10:55								iviatr'i)	. 30110
Method: D2216-90 - Water (Mo	isture) Con	itent	-		l la it	_	Due y correct	A	
	Result	Quaimer		KL		U	Prepared		
woisture Content	19.5		0.01		%			05/14/18 14:48	1

Client Sample Results

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

Analyte	Result Qualifier	NONE	NONE Unit	D	Prepared	Analyzed	Dil Fac
Gravel	11.1		%			05/15/18 09:21	1
Coarse Sand	25.7		%			05/15/18 09:21	1
Medium Sand	33.4		%			05/15/18 09:21	1
Fine Sand	19.7		%			05/15/18 09:21	1
Silt	6.9		%			05/15/18 09:21	1
Clay	3.3		%			05/15/18 09:21	1

QC Sample Results

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

5

Method: D2216-90 - Water (Moisture) Content

Lab Sample ID: 590-8467-1 D Matrix: Solid	U							Client Sample II Prep Type	D: Ba : Tota	isin 1 al/NA
Analysis Batch. 273791	Sample	Sample		DU	DU					RPD
Analyte	Result	Qualifier	R	sult	Qualifier	Unit	D		RPD	Limit
Moisture Content	27.8			16.5	F3	%			51	20

Method: D2974 - Moisture, Ash and Organic Matter

Lab Sample ID: 590-8467-1 I Matrix: Solid Analysis Batch: 515225	JU						Client Sample ID: B Prep Type: To	asin 1 tal/NA
	Sample	Sample	DU	DU				RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D	RPD	Limit
Loss on Ignition	15.3		 10.4	F3	%			20

TestAmerica Spokane

TestAmerica Job ID: 590-8467-1

Lab Sample ID: 590-8467-1

Lab Sample ID: 590-8467-2

Lab Sample ID: 590-8467-3

Matrix: Solid

Matrix: Solid

Matrix: Solid

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

2 3 4 5 6 7 8

Date Collected: 05/01/18 10:30 Date Received: 05/02/18 10:55

Client Sample ID: Basin 1

Prep Type Total/NA	Batch Type Analysis	Batch Method D2216-90	Run	Dil Factor	Initial Amount	Final Amount	Batch Number 273791	Prepared or Analyzed 05/14/18 14:48	Analyst EMM	Lab TAL SEA
Total/NA	Analysis	D2974		1			515225	05/09/18 07:15	BMC	TAL NSH
Total/NA	Analysis	D422		1			273830	05/15/18 09:21	HJM	TAL SEA

Client Sample ID: Basin 2 Date Collected: 05/01/18 10:30 Date Received: 05/02/18 10:55

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Ргер Туре	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	D2216-90		1			273791	05/14/18 14:48	EMM	TAL SEA

Client Sample ID: Basin 3 Date Collected: 05/01/18 10:30 Date Received: 05/02/18 10:55

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	D2216-90		1			273791	05/14/18 14:48	EMM	TAL SEA
Total/NA	Analysis	D2974		1			515225	05/09/18 07:15	BMC	TAL NSH
Total/NA	Analysis	D422		1			273830	05/15/18 09:21	HJM	TAL SEA

Client Sample ID: Basin 4

Date Collected: 05/01/18 10:30 Date Received: 05/02/18 10:55

Lab Sample ID: 590-8467-4

Matrix: Solid

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	D2216-90		1			273791	05/14/18 14:48	EMM	TAL SEA
Total/NA	Analysis	D422		1			273830	05/15/18 09:21	HJM	TAL SEA

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

Authority	Program		EPA Region	Identification Number	Expiration Date	
Washington	State Prog	ram	10	C569	01-06-19	
aboratory: Test	America Nashvil	le				
nless otherwise noted, all	analytes for this laborator	y were covered un	der each accreditation	n/certification below.		
Authority	Program		EPA Region	Identification Number	Expiration Date	
					· _ · _ · / _ · / _ /	
Washington	State Prog	ram	10	C789	07-19-18	
Washington The following analytes	State Prog	ram	10 /certification is not off	C789 ered by the governing author	07-19-18 prity:	
Washington The following analytes Analysis Method	State Prog are included in this report Prep Method	ram , but accreditation, Matrix	10 /certification is not off Analyt	C789 ered by the governing authore	07-19-18 prity:	
Washington The following analytes Analysis Method D2974	State Prog are included in this report Prep Method	ram , but accreditation/ <u>Matrix</u> Solid	10 /certification is not offe Analyt Loss c	C789 ered by the governing autho e n Ignition	07-19-18 prity:	
Washington The following analytes Analysis Method D2974 aboratory: Test	State Prog	ram , but accreditation, <u>Matrix</u> Solid	10 /certification is not off Analyt Loss c	C789 ered by the governing autho e n Ignition	07-19-18 ority:	
Washington The following analytes Analysis Method D2974 .aboratory: Test nless otherwise noted, all	State Progression State Progression State Progression Prep Method Prep Method America Seattle analytes for this laboratory	ram , but accreditation, <u>Matrix</u> Solid y were covered un	10 /certification is not off Analyt Loss c	C789 ered by the governing authors n Ignition n/certification below.	07-19-18 prity:	
Washington The following analytes Analysis Method D2974 .aboratory: Test nless otherwise noted, all	State Program	ram , but accreditation, <u>Matrix</u> Solid y were covered un	10 /certification is not off Analyt Loss c der each accreditation	C789 ered by the governing authors n Ignition n/certification below.	07-19-18 brity: 	

Method Summary

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

Method	Method Description	Protocol	Laboratory
D2216-90	Water (Moisture) Content	ASTM	TAL SEA
D2974	Moisture, Ash and Organic Matter	ASTM	TAL NSH
D422	Grain Size	ASTM	TAL SEA

Protocol References:

ASTM = ASTM International

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177 TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TestAmerica Spokane		Chain c	of Custody Record		TestAmerica
Spokane, WA 99206-5302 phone 509.924.9200 fax 509.924.9290	Regulatory Program	: DW MAPDES	RCRA Dther		
Client Contact	Project Manager: Jon Moi	row	ite Contact: Gordon Crane	Date: 4/30/18-5-1-18	COC No:
City of Ellensburg	Tel/Fax: (509) 925-8619		ab Contact: Chris Williams	Carrier: UP5	of COCs
501 N. Anderson St.	Analysis Turnarc	ound Time			Sampler:
Ellensburg WA 98926		WORKING DATS	ð		For Lab Use Only:
(509) 962-7236 Phone (509) 962-7236 FAX	TAT if different from Belo	×			Valk-In Client:
Project Name: Street Sweep/CB clean effectiveness study	1 week	YIN			and Company.
Site: SR97, Ellensburg WA	2 days	le ()	ASD		Joh / SDG No :
P0#		ampl	S / N		
	Sample Sample Type	and Same	rform M		
Sample Identification	Date Time G=G	ab) Matrix Cont. L	Pe		Sample Specific Notes:
Basin 1 Moisture Content	5-1-18 10:15 G	S			
Basin 2 Moisture Content	5-1-18/10:4 6	S)			
Basin 3 Moisture Content	5-1-18 10:15 G	w W			
Basin 4 Moisture Content	5-1-18 10:15 G	S			17
Basin I OGANIC CONTENT	5-1-18 10:30 G				of
Basin 3 GRANIC Content	5-1-18 10:30 G				e_12
Besin 1 PSD	S-1-18 10:30 G				Pag
Basin 3 PSD	5-1-18 16:30 G				
Basin4 PSD	5-1-18 10:30 G	-			
1				590-8467 Cha	in of Custody
Preservation Used: 1= Ice) 2= HCI; 3= H2SO4; 4=HNO3;	5=NaOH; 6= Other				
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Plea Comments Section if the lab is to dispose of the sample.	se List any EPA Waste Codes	for the sample in the	Sample Disposal (A fee may	be assessed if samples are retai	ined longer than 1 month)
Von-Hazard Flammable Skin Irritant	Poison B	Unknown	Return to Client	hisposal by Lab Archive for	Months
Special Instructions/QC Requirements & Comments:				0	
Custody Seals Intact: 📈 Yes 🗌 No	Custody Seal No .:		Cooler Temp. (°C): C	bs'd: 4, 7 Corr'd: 4, 6	Therm ID No .: TROXY
Relinquished by: Jon Marrow	Company:	Date/Time: 10:10	Received by: In Ann	A Company: 400	Daterime: A 10555
Relinquished by: GOIZUAN CANC	Company: 1	Date/Time:	Received by:	Company:	Dale/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
				Eorm No C	A C WILDOD Dov A 12 Hatod 0/1/2017

Nashville, TN COOLER RECEIPT FORM 590-8	467 Chain of Custody
Cooler Received/Opened On05-03-2018_@09:20	
Time Samples Removed From Cooler 1501 Time Samples Placed In Storage 1500	_ (2 Hour Window)
1. Tracking # <u>(last 4 digits, FedEx)</u> A (A - A - A - A - A - A - A - A - A -	4
IR Gun ID31470368 pH Strip Lot $/V /A$ Chlorine Strip Lot $/V /Z$	
2. Temperature of rep. sample or temp blank when opened: 12 Degrees Celsius	~
3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen?	YES NO. NA
4. Were custody seals on outside of cooler? If yes, how many and where:	YESNONA
5. Were the seals intact, signed, and dated correctly?	(ES)NONA
6. Were custody papers inside cooler?	YES. NONA
I certify that I opened the cooler and answered guestions 1-6 (intial)	<u> </u>
7. Were custody seals on containers: YES (NO) and Intact	YESNO.
Were these signed and dated correctly?	YESNONA
8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Pag	per Other None
9. Cooling process:	Other, None
10. Did all containers arrive in good condition (unbroken)?	ES.NONA
11. Were all container labels complete (#, date, signed, pres., etc)?	YESNONA
12. Did all container labels and tags agree with custody papers?	ESNONA
13a. Were VOA vials received?	YESNONA
b. Was there any observable headspace present in any VOA vial?	YESNO. (NA)
Larger than this.	-
14. Was there a Trip Blank in this cooler? YES. (NO.).NA If multiple coolers, sequen	ce #
I certify that I unloaded the cooler and answered questions 7-14 (initial)	<u>}</u>
15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level?	YESNONA
b. Did the bottle labels indicate that the correct preservatives were used	(ES.).NONA
16. Was residual chlorine present?	YESNONA
I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial)	<u>OH</u>
17. Were custody papers properly filled out (ink, signed, etc)?	YESNONA
18. Did you sign the custody papers in the appropriate place?	YESNONA
19. Were correct containers used for the analysis requested?	(YES)NONA
20. Was sufficient amount of sample sent in each container? $<$	FES NO NA
I certify that I entered this project into LIMS and answered questions 17-20 (initial)	
Lertify that Lattached a label with the unique LIMS number to each container (intial)	T
21. Were there Non-Conformance issues at login? YES. NO Was a NCM generated? YES(0)	#

pokane	
estAmerica S _I	1922 East 1st Ave

Loc: 590



11922 East 1st Ave Spokane, WA 99206 N-2-2 6-00, MA 90206	0	hain c	of Cust	ody Re	cord			-	1		ADER IN ENV	RONMENTAL TESTING	
Phone (pna) 924-9200 Fax (pna) 924-9290	Samolar			ANG He I			I						
Client Information (Sub Contract Lab)				Arringt	on, Randee	ш		-		590-35	15.1		
Client Contact: Shipping/Receiving	Phone:			E-Mail: randee	.arrinaton@	testamericaino	L COM	State of Origin: Washington		Page: Page 1	of 1		-
Company: TestAmerica Laboratories, Inc				A N N	creditations R tate Prograu	equired (See note m - Washingtol				Job #:	67-1		-
Address: 2960 Foster Creighton Drive.	Due Date Requeste 5/14/2018	ÿ				Ana	Ivsis Re	nested		Preserv	/ation Codes		
City: Moschaile	TAT Requested (da	ys):			ð					A - HCL B - NaOI	I	/ - Hexane V - None	_
ited interest in the second	-				tis Mati					C - Zh A	cetate c Acid F SO4	0 - AsNaO2 • - Na2O4S Q - Na2SO3	
Phone: 615-726-0177(Tel) 615-726-3404(Fax)	PÓ#;				, Organ				·	G - Amci G - Amci H - Acco	H thior thior Activ	R - Na2S203 5 - H2SO4 7 - TSD Dodecohudotta	
Email:	:# OM				garbon					1 - 1ce	ater	J - Acetone /- MCAA	
Project Name: City of Ellensburg Effectiveness Study	Project #: 59001497	l		50 <u>01</u> /0	asulc (HEIDER L - EDT	A	v - pH 4-5 2 - other (specify)	
Site:	SSOW#:				io 'usi 別(沢)					oti con			-
Samula Idantification . Cliant ID (1 ab ID)	Commo Date	Sample	Sample Type (C=comp,	Matrix (w=water, s=solid, o=wasteroit,	M/SM(000016) A (OOM) \4762_0		^			o bedmiu N. listo			
		X	Preservati	on Code:								Incholis/More.	-
Basin 1 (590-8467-1)	5/1/18	10:15 Pacific		Solid	×					QAPP II	equires site s	pecific duplicates at	
Basin 3 (590-8467-3)	5/1/18	10:15 Dacific		Solid	×					CAPP II	equires site s	pecific duplicates at	
							-			8/07/			
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Note: Since laboratory accreditations are subject to change. TestAmerica Labo currently maintain accreditation in the State of Origin listed above for analysis/ Laboratories, Inc. attention immediately. If all requested accreditations are cur	ratories, Inc. places the ests/matrix being analyz rent to date, return the si	ownership of m ed, the samples gned Chain of (ethod, analyte & s must be shipp Custody attestir	& accreditation or led back to the T ig to said compli	ompliance upo estAmerica lab cance to TestA	n out subcontract l oratory or other in merica Laboratori	aboratories. structions will es, Inc.	This sample ship be provided. An	ment is forwarc	led under chain-of- ccreditation status (custody. If the should be brou	laboratory does not ight to TestAmerica	
Possible Hazard Identification					Sample L	isposal (A fe	e may be	issessed if s	amples are	retained long	er than 1 n	ionth)	
Unconfirmed Dolivership Berniseted: 1 11 11/ NH57 (second) A	Drimon, Dolivor	blo Deale				urn To Client		Disposal By L	ab _	Archive For		Months	
Deliverable Requested: 1, 11, 11, 1V, Other (specify)	Primary Delivera	IDIE RANK: 2			special in	Structions/CC	Kequireme	nts:					
Empty Kit Relinquished by:		Date:		<u>-</u>	ime:	ł		Method o	f Shipment:				_
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Custody Seals Intact: Custody Seal No.: Δ Yes Δ No					Cooler	Temperature(s) °C	and Other R	emarks:	5				1
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TestAmerica Spokane

11922 East 1st Ave Spokane, WA 99206 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record



<u>TestAmerica</u>

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:				ab PM Irrina	i ton, F	Rand	lee E						Carri	er Tra	cking	No(s)	3			COC No: 590-3514 1	
Client Contact:	Phone:			E	Mail;									State	of Or	igin:					Page:	J
Shipping/Receiving	<u> </u>			fa	andee	e.arrii	ngtor	n@te	stam	erica	ninc.c	com		Was	shing	ton				_	Page 1 of 1	
TestAmerica Laboratories, Inc.					s	State	Prog	ram	- Was	shing	ton										590-8467-1	
Address: 5755 8th Street Fast	Due Date Request 5/14/2018	led:			Т					Δ,	nalv	eie I	Roo		tod						Preservation Co	des:
City:	TAT Requested (d	ays):			(150	1	r	1			lary	313	Neq	ues	teu				1		A - HCL B - NaOH	M - Hexane
Tacoma					100000																C - Zn Acetate	O - AsNaO2
State, Zip: WA, 98424																					D - Nitric Acid E - NaHSO4	P - Na2O4S Q - Na2SO3
Phone:	PO #:																		100000000		F - MeOH G - Amchlor	R - Na2S2O3 S - H2SO4
253-922-2310(1el) 253-922-5047(Fax)	WO #																				H - Ascorbic Acid	T - TSP Dodecahydrate
						101	B												0.0349455	2	J - DI Water	V - MCAA
Project Name: City of Ellensburg Effectiveness Study	Project #:				22		Meth											Í	000000		L - EDA	vv - pH 4-5 Z - other (specify)
Site:	SSOW#:				-	00	ocal	87.											Contraction of the local data	ξĮ,	Other:	
				, · · ·			D) L	ah S												5		
			Sample	Matrix	1010	101	(MO	2 Gr												nbe		
		Comple	Туре	(W=water, S=solid,		E	6 9	1 D42					ĺ						010000000000000000000000000000000000000	Z		
Sample Identification - Client ID (Lab ID)	Sample Date	Time	(C=comp, G=grab)	Orwaste/oi 91=7issue, Ar	L Alt)		D221	0422											ALC: NO.	8	Special In	structions/Note:
	\gg	$>\!$	Preserva	tion Code	: (X	X													Ď	X	Green	
Basin 1 (590-8467-1)	5/1/18	10:15 Pacific		Solid	Γ	T	х	X										- Contraction		2		
Basin 2 (590-8467-2)	5/1/18	10:15 Pacific		Solid			х										•••••		1 14.7050103	1		
Basin 3 (590-8467-3)	5/1/18	10:15 Pacific		Solid			х	х												2		
Basin 4 (590-8467-4)	5/1/18	10:30 Pacific		Solid			х	х											10120100	2		
																			12000 March 1			
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Note: Since laboratory accreditations are subject to change, TestAmerica Laborato	ries, Inc. places the	ownership of m	ethod, analyte	& accreditat	tion co	mplian	nce up	oon ou	tsubc	ontrac	t labo	ratorie	s. Th	is san	npie sl	hipme	nt is f	orward	ied un	der c	hain-of-custody. If t	the laboratory does not
currently maintain accreditation in the State of Origin listed above for analysis/tests Laboratories, Inc. attention immediately. If all requested accreditations are current	/matrix being analyz/ to date, return the si	ed, the sample: igned Chain of	s must be ship Custody attest	ped back to ting to said co	the Te omplic	stAme ance to	rica la o Tesi	aborat tAmer	ory or ica Lai	other i borato	instruc ries, l	ctions v nc.	will be	e provi	ded.	Any cl	nange	is to a	ccredit	tation	status should be br	ought to TestAmerica
Possible Hazard Identification						San	nple	Disp	osal	(AŤ	Гee л	nay b	e as	sess	ed il	f san	ple	s are	retai	inea	l longer than 1	month)
Unconfirmed							\Box_{Re}	eturn	To C	lient			ום ב	spos	al By	Lab			⊐ _{Ar}	chiv	e For	Months
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Delivera	able Rank: 2				Spe	cial I	nstru	iction	s/QC	Red	quirer	nent	S:								
Empty Kit Relinquished by:		Date:			Ti	me:				1				'	lethod	d of Si	nipme	nt:				
Relinguished by:	Date/Time:	5. W		Company	40	$\sqrt{2}$	Recei	ved by	r. }	¥,	4	/	~			TC.	Date/T	ime:	l h	ç	1950	Company
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Custody Scole Istact, Custody Scol No.			<u></u>				0	- T				0.4	~					-				1
A Yes A No						ľ	Loolei	riemj	peratu	re(s) "	C and	Other	Rem	arks.					R4		10.5/10.	3 113 133

Login Sample Receipt Checklist

Client: HDR Inc

Login Number: 8467 List Number: 1 Creator: Kratz, Sheila J

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td>Lab does not accept radioactive samples.</td>	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	#214681,214680
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Not listed on COC
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.

List Source: TestAmerica Spokane

Login Sample Receipt Checklist

Client: HDR Inc

Login Number: 8467 List Number: 3 Creator: Blankinship, Tom X

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	10.5°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 590-8467-1

List Source: TestAmerica Seattle

List Creation: 05/04/18 10:17 AM



THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Spokane 11922 East 1st Ave Spokane, WA 99206 Tel: (509)924-9200

TestAmerica Job ID: 590-8467-2

Client Project/Site: City of Ellensburg Effectiveness Study

For:

HDR Inc 1401 E. Trent Ave Suite 101 Spokane, Washington 99202

Attn: Aimee Navickis-Brasch

tardue trington

Authorized for release by: 5/24/2018 9:13:45 AM

Randee Arrington, Project Manager II (509)924-9200 randee.arrington@testamericainc.com

LINKS Review your project results through TOTOL ACCESS Have a Question? Ask The Expert

Visit us at: www.testamericainc.com This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

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Client Sample Results	6
QC Sample Results	7
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Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

Job ID: 590-8467-2

Laboratory: TestAmerica Spokane

Narrative

Receipt

The samples were received on 5/2/2018 10:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6° C.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study TestAmerica Job ID: 590-8467-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	3
590-8467-3	050118CBCS-1	Solid	05/01/18 10:30	05/02/18 10:55	4
					5
					8
					9

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

5

Qualifiers

Geotechnical

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

			Client	Sample Re	esults	5					
Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study								TestAmerica Job ID: 590-8467-2			
Client Sample ID: Date Collected: 05/01	050118CBCS-1]						Lab Sa	mple ID: 590- Matri	8467-3 ix: Solid	
Date Received: 05/02	/18 10:55										
Method: D2216-90 - Analyte	Water (Moisture)	Content Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac	5
Moisture Content		210.7		0.01		%			05/23/18 09:38	1	6
											8
											9

10 11

Method: D2216-90 - Water (Moisture) Content

Lab Sample ID: 580-77294-B-1 DU Matrix: Solid Analysis Batch: 274446							Client Sample ID: Dup Prep Type: To	olicate tal/NA
	Sample	Sample	DU	DU				RPD
Analyte	Result	Qualifier	Result	Qualifier	Unit	D	RPD	Limit
Moisture Content	52.1		36.4	F3	%		35	20

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

Client Sample Date Collected:	D: 050118	BCBCS-1						Lab Sam	ple ID: {	590-8467-3 Matrix: Solid
Date Received: (05/02/18 10:5	5								
Г	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	D2216-90		1			274446	05/23/18 09:38	EMM	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

TestAmerica Job ID: 590-8467-2

5

9

Client: HDR Inc
Project/Site: City of Ellensburg Effectiveness Study

Laboratory: TestAmerica Spokane The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C569	01-06-19

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority Program			EPA Region	Identification Number	Expiration Date
Washington	State Prog	State Program		C553	
The falls for a set to a	· · · · · · · · · · · · · · · · · · ·	a correction / contifica	tion is not offered by th	a governing outbority	
I ne following analytes	are included in this report, but	accreditation/certifica	ition is not offered by th	le governing authority.	
Analysis Method	Prep Method	Matrix	Analyt	te	

TestAmerica Spokane

Client: HDR Inc Project/Site: City of Ellensburg Effectiveness Study

TestAmerica Job ID: 590-8467-2

Laboratory

TAL SEA

5	
8	
9	
1	0

 Method
 Method Description
 Protocol

 D2216-90
 Water (Moisture) Content
 ASTM

Protocol References:

ASTM = ASTM International

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TestAmerica Spokane

Login Sample Receipt Checklist

Client: HDR Inc

Login Number: 8467 List Number: 1

Creator: Kratz, Sheila J

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td>Lab does not accept radioactive samples.</td>	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	#214681,214680
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Not listed on COC
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.

List Source: TestAmerica Spokane

Client: HDR Inc

Login Number: 8467 List Number: 3 Creator: Blankinship, Tom X

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	False	Refer to Job Narrative for details.
Cooler Temperature is recorded.	True	10.5°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Job Number: 590-8467-2

List Source: TestAmerica Seattle

List Creation: 05/04/18 10:17 AM

June 2018 Data Collection Event

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: Address: Attn:	CITY OF ELLEN 501 N ANDERSO ELLENSBURG, JON MORROW	SBURG ON ST WA 98926			Batch #: Project Name:	180706055 STREET S CATCH BA	5 GWEEPING ASIN	GVS
			Analytical R	esults	Report			
Sample Number Client Sample ID Matrix Comments	180706055-001 061818SSTS1 Solid		Sampling Date Sampling Time Sample Locatior	7/3/2018 3:30 PM	Date/Ti Extract	me Received ion Date	7/6/2018	5:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		93.7 6.3	% Percent	0.1	8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM	TLM CME	% solids %moisture	
Sample Number Client Sample ID Matrix Comments	180706055-002 061818SSTS2 Solid		Sampling Date Sampling Time Sample Locatior	7/3/2018 3:30 PM	Date/Ti Extract	me Received ion Date	7/6/2018	5:14 PM
- .								
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Parameter % solids		Result 94.8	Units %	PQL 0.1	Analysis Date 8/10/2018 11:18:00 AM	Analyst TLM	Method % solids	Qualifier
Varameter % solids %moisture		Result 94.8 5.2	Units % Percent	PQL 0.1	Analysis Date 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM	Analyst TLM CME	Method % solids %moisture	Qualifier
Sample Number Client Sample ID Matrix Comments	180706055-003 061818SSTS3 Solid	Result 94.8 5.2	Units % Percent Sampling Date Sampling Time Sample Location	PQL 0.1 7/3/2018 3:30 PM	Analysis Date 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM Date/Ti Extract	Analyst TLM CME me Received ion Date	Method % solids %moisture 7/6/2018	Qualifier 5:14 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter	180706055-003 061818SSTS3 Solid	Result 94.8 5.2 Result	Units % Percent Sampling Date Sampling Time Sample Location Units	PQL 0.1 7/3/2018 3:30 PM PQL	Analysis Date 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM Date/Ti Extract Analysis Date	Analyst TLM CME me Received ion Date	Method % solids %moisture 7/6/2018 Method	Qualifier 5:14 PM Qualifier
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids	180706055-003 061818SSTS3 Solid	Result 94.8 5.2 Result	Units % Percent Sampling Date Sampling Time Sample Location Units %	PQL 0.1 7/3/2018 3:30 PM PQL 0.1	Analysis Date 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM Date/Ti Extract Analysis Date 8/10/2018 11:18:00 AM	Analyst TLM CME me Received ion Date Analyst TLM	Method % solids %moisture 7/6/2018 Method % solids	Qualifier 5:14 PM Qualifier
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture	180706055-003 061818SSTS3 Solid	Result 94.8 5.2 Result 94 6	Units % Percent Sampling Date Sample Location Units % Percent	PQL 0.1 7/3/2018 3:30 PM PQL 0.1	Analysis Date 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM Date/Ti Extract Analysis Date 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM	Analyst TLM CME me Received ion Date Analyst TLM CME	Method % solids %moisture 7/6/2018 Method % solids %moisture	Qualifier 5:14 PM Qualifier
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments	180706055-003 061818SSTS3 Solid 180706055-004 061818CBTS1 Solid	Result 94.8 5.2 Result 94 6	Units % Percent Sampling Date Sample Location Units % Percent Sampling Date Sampling Time Sample Location	PQL 0.1 3:30 PM PQL 0.1 7/3/2018 3:45 PM	Analysis Date 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM Date/Ti Extract 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM Date/Ti Extract	Analyst TLM CME me Received ion Date Analyst TLM CME me Received ion Date	Method % solids %moisture 7/6/2018 Method % solids %moisture 7/6/2018	Qualifier 5:14 PM Qualifier 5:14 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter	180706055-003 061818SSTS3 Solid 180706055-004 061818CBTS1 Solid	Result 94.8 5.2 Result 94 6 Result	Units % Percent Sampling Date Sampling Time Sample Location % Percent Sampling Date Sampling Time Sample Location	PQL 0.1 7/3/2018 3:30 PM PQL 0.1 7/3/2018 3:45 PM	Analysis Date 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM Date/Ti Extract Analysis Date 8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM Date/Ti Extract Analysis Date	Analyst TLM CME me Received ion Date Analyst TLM CME me Received ion Date Analyst	Method % solids %moisture 7/6/2018 Method % solids %moisture 7/6/2018	Qualifier 5:14 PM Qualifier 5:14 PM

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Client: Address: Attn:	CITY OF ELLENS 501 N ANDERSO ELLENSBURG, W JON MORROW	BURG N ST /A 98926			Batch #: Project Name:	180706055 STREET S CATCH BA	5 SWEEPINC ASIN) VS
			Analytical R	esults	Report			
Sample Number Client Sample ID Matrix Comments	180706055-005 061818CBTS2 Solid		Sampling Date Sampling Time Sample Location	7/3/2018 3:45 PM	Date/Tii Extract	ne Received ion Date	7/6/2018	5:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		70.5	%	0.1	8/10/2018 11:18:00 AM	TLM	% solids	
%moisture		29.5	Percent		7/12/2018 3:30:00 PM	CME	%moisture	
Sample Number Client Sample ID Matrix Comments	180706055-006 061818CBTS3 Solid		Sampling Date Sampling Time Sample Location	7/3/2018 3:45 PM	Date/Ti Extract	me Received ion Date	7/6/2018	5:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		79.5	%	0.1	8/10/2018 11:18:00 AM	TLM	% solids	
%moisture		20.5	Percent		7/12/2018 3:30:00 PM	CME	%moisture	
Sample Number Client Sample ID Matrix Comments	180706055-007 061818CBCS1 Solid		Sampling Date Sampling Time Sample Location	7/3/2018 3:55 PM	Date/Tii Extract	ne Received ion Date	7/6/2018	5:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		76.9	%	0.1	8/10/2018 11:18:00 AM	TLM	% solids	
%moisture		23.1	Percent		7/12/2018 3:30:00 PM	CME	%moisture	
Sample Number Client Sample ID Matrix Comments	180706055-008 061818CBCS2 Solid		Sampling Date Sampling Time Sample Location	7/3/2018 3:55 PM	Date/Tii Extract	ne Received ion Date	7/6/2018	5:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		59.1	%	0.1	8/10/2018 11:18:00 AM	TLM	% solids	
%moisture		40.9	Percent		7/12/2018 3:30:00 PM	CME	%moisture	

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Client: Address: Attn:	CITY OF ELLENS 501 N ANDERSO ELLENSBURG, V JON MORROW	SBURG ON ST VA 98926	3		Batch #: Project Name:	180706055 STREET S CATCH BA	5 SWEEPING ASIN	9 VS
			Analytical F	Results	Report			
Sample Number Client Sample ID Matrix Comments	180706055-009 061818CBCS3 Solid		Sampling Date Sampling Time Sample Location	7/3/2018 3:55 PM n	Date/Ti Extract	me Received ion Date	7/6/2018	5:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		55 45	% Percent	0.1	8/10/2018 11:18:00 AM 7/12/2018 3:30:00 PM	TLM CME	% solids %moisture	

Authorized Signature

Kathleen a. Sattle

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

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Client:	CITY OF ELLENSBURG	Batch #:	180619070
Address:	501 N ANDERSON ST	Project Name:	STREET SWEEPING VS
	ELLENSBURG, WA 98926		CATCH BASIN CLEANING
Attn:	JON MORROW		

Analytical Results Report

Sample Number180619070-001Client Sample ID061918 CBS1 TSMatrixSolidCommentsKatalana		Sa Sa Sa	Sampling Date6/19/2018Sampling Time12:15 PMSample Location		D. E:	Date/Time Received Extraction Date		3:56 PM
Parameter	Re	esult	Units	PQL	Analysis Date	e Analyst	Method	Qualifier
% solids %moisture	7 9	7.2 02.8	Percent Percent	0.1	6/28/2018 6/28/2018	KAS KAS	% solids %moisture	

Sample Number 180619070-002 Client Sample ID 061918 CBS2 TS Matrix Solid Comments Comments		Sampling Date6/19/2018Sampling Time12:00 PMSample Location		Da Ex	Date/Time Received Extraction Date		3:56 PM	
Parameter	R	esult	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		17.7	Percent	0.1	6/28/2018	KAS	% solids	
%moisture	:	82.3	Percent		6/28/2018	KAS	%moisture	

Sample Number180619070-003Client Sample ID061918 CBS3 TSMatrixSolidComments		Sampling Date Sampling Time Sample Location	Sampling Date6/19/2018Sampling Time12:00 PMSample Location		Date/Time Received 6 Extraction Date		3:56 PM	
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		24.1	Percent	0.1	6/28/2018	KAS	% solids	
%moisture		75.9	Percent		6/28/2018	KAS	%moisture	

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Client:	CITY OF ELLENSBURG	Batch #:	180619070
Address:	501 N ANDERSON ST	Project Name:	STREET SWEEPING VS
	ELLENSBURG, WA 98926		CATCH BASIN CLEANING
Attn:	JON MORROW		

Analytical Results Report

Sample Number 180619070-004 Client Sample ID 061918 CBS4 TS Matrix Solid Comments Solid		Sampling Date Sampling Time Sample Location	Sampling Date6/19/2018Sampling Time12:00 PMSample Location		Date/Time Received 6/19/2018 Extraction Date			
Parame	er	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		17.5	Percent	0.1	6/28/2018	KAS	% solids	
%moistu	re	82.5	Percent		6/28/2018	KAS	%moisture	

Sample Number180619070-005Client Sample ID061918 CBS5 CSMatrixSolidComments		Sampling Date Sampling Time Sample Locatior	6/19/2018 12:30 PM 1	Date/Time Received Extraction Date		6/19/2018	3:56 PM	
Parameter	R	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		25.2 74.8	Percent Percent	0.1	6/28/2018 6/28/2018	KAS KAS	% solids %moisture	

Sample Number180619070-006Client Sample ID061918 CBS6 CSMatrixSolidComments		Sampling Date Sampling Time Sample Location	ampling Date 6/19/2018 ampling Time 12:45 PM ample Location		Date/Time Received 6/19/201 Extraction Date		3:56 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture	13.6 86.4	Percent Percent	0.1	6/28/2018 6/28/2018	KAS KAS	% solids %moisture	
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Client:	CITY OF ELLENSBURG	Batch #:	180619070
Address:	501 N ANDERSON ST	Project Name:	STREET SWEEPING VS CATCH BASIN CLEANING
Attn:	JON MORROW		

Analytical Results Report

Sample Number 180619070-007 Client Sample ID 061918 CBS7 CS Matrix Solid Comments Solid		Sampling Date Sampling Time Sample Locatio	Sampling Date6/19/2018Sampling Time12:50 PMSample Location		Date/Time Received Extraction Date		
Parameter	Re	sult Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids	23	3.9 Percent	0.1	6/28/2018	KAS	% solids	
%moisture	76	6.1 Percent		6/28/2018	KAS	%moisture	

Authorized Signature

athleen a

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

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				061918CBSTS	061918CBSCS	
LABORATORY NUMBER				18-0607	18-0608	18-0609
PROJECT SAMPLE NUMBER				061918 TS	061918 CS	061818SSTS
SAMPLED BY				Client	Client	Client
SAMPLE TYPE				Bulk	Bulk	Bulk
DATE RECEIVED				7/26/18	7/26/18	7/26/18
				North	South	North
		Units	Test Method			
MOISTURE CONTENT		%		1.8	1.5	5.5
SIEVE ANALYSIS			ASTM D422			
	2 (4 11					100
0	3/4"				100	100
S	1/2"				100	99
1	3/8"	<i></i>		100	99	95
E	1/4"	%		95	97	88
V	#10			86	78	56
E	#16	Р		83	73	40
	#30	А		81	69	22
S	#40	S		80	68	16
Ι	#100	S		76	61	8
Z	#200	Ι		73	55	5.3
E	.05mm	Ν		72	47	5.2
	.01mm	G		46	27	2.9
	.005mm			22	15	2.3
	.001mm			5.0	2.4	1.0

SOILS LABORATORY SUMMARY

Budinger & Associates, Inc. Geotechnical & Environmental Engineers Construction Materials Testing & Special Inspection

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Login Report

Customer Name	: CITY OF ELLENS	SBURG		Order ID:	: 180619070
	501 N ANDERSC ELLENSBURG	ON ST V	WA 98926	Order Date	: 6/19/2018
Contact Name	: JON MORROW			Project Name: STREE	ET SWEEPING VS
Comment	::			CLEAN	H BASIN NING
Sample #: 18061	9070-001 Customer S	Sample #: 06	31918 CBS1 TS		
Recv'd: 🖌 N	latrix: Solid	Collector: G	ORDON CRANE	Date Collected: 6/19/2	2018
Quantity: 1	Date Received:	6/19/2018 3:56:0	00 PM	Time Collected: 12:15	PM
Comment:					
Test		Lab	Method	Due Date P	Priority
% SOLIDS		S	% solids	6/29/2018	Normal (~10 Days)
%Moisture		S	%moisture	6/29/2018	Normal (~10 Days)
Sample #: 18061	9070-002 Customer S	Sample #: 06	61918 CBS2 TS		
Recv'd: 🖌 M	latrix: Solid	Collector: G	ORDON CRANE	Date Collected: 6/19/2	2018
Recv'd: 🖌 M Quantity: 1	latrix: Solid Date Received: 6	Collector: G	ORDON CRANE 00 PM	Date Collected:6/19/2Time Collected:12:00	2018 PM
Recv'd: <mark>√</mark> M Quantity: 1 Comment:	latrix: Solid Date Received: 6	Collector: G(6/19/2018 3:56:0	ORDON CRANE 00 PM	Date Collected:6/19/2Time Collected:12:00	2018 PM
Recv'd: <mark>v</mark> M Quantity: 1 Comment: Test	latrix: Solid Date Received: 6	Collector: G 6/19/2018 3:56:0 Lab	ORDON CRANE 00 PM Method	Date Collected:6/19/2Time Collected:12:00Due DateP	2018 PM Priority
Recv'd: ✓ M Quantity: 1 Comment: Test % SOLIDS	fatrix: Solid Date Received: 6	Collector: G 6/19/2018 3:56:0 Lab S	ORDON CRANE 00 PM Method % solids	Date Collected: 6/19/2 Time Collected: 12:00 Due Date P 6/29/2018 <u>/</u>	2018 PM Priority <u>Vormal (~10 Days)</u>
Recv'd: ✓ M Quantity: 1 Comment: Test % SOLIDS %Moisture	latrix: Solid Date Received: 6	Collector: G 6/19/2018 3:56:0 Lab S S	ORDON CRANE 00 PM Method % solids %moisture	Date Collected: 6/19/2 Time Collected: 12:00 Due Date P 6/29/2018 <u>6</u> 6/29/2018 <u>6</u>	2018 PM Priority Normal (~10 Days) Normal (~10 Days)
Recv'd: ✓ M Quantity: 1 1 Comment: 1 1 Test × 1 % SOLIDS × 1 %Moisture 18061	Natrix: Solid Date Received: 6	Collector: G 6/19/2018 3:56:0 Lab S S Sample #: 06	ORDON CRANE 00 PM Method % solids %moisture 31918 CBS3 TS	Date Collected: 6/19/2 Time Collected: 12:00 Due Date P 6/29/2018 1 6/29/2018 1	2018 PM Priority Normal (~10 Days) Normal (~10 Days)
Recv'd: ✓ M Quantity: 1 1 Comment: 1 1 Test × 1 % SOLIDS × 1 %Moisture 18061 Recv'd: ✓ M	Natrix: Solid Date Received: 6 9070-003 Customer S Natrix: Solid	Collector: G 6/19/2018 3:56:0 Lab S S Sample #: 06 Collector: G	ORDON CRANE 00 PM Method % solids %moisture 51918 CBS3 TS ORDON CRANE	Date Collected: 6/19/2 Time Collected: 12:00 Due Date P 6/29/2018 <u>M</u> 6/29/2018 <u>M</u> Date Collected: 6/19/2	2018 PM Priority <u>Normal (~10 Days)</u> Normal (~10 Days)
Recv'd: ✓ M Quantity: 1 1 Comment: 1 1 Test × 1 % SOLIDS × 1 %Moisture 18061 Recv'd: ✓ M Quantity: 1 1	Iatrix: Solid Date Received: 6 9070-003 Customer S Iatrix: Solid 6 Date Received: 6	Collector: G 6/19/2018 3:56:0 Lab S S Sample #: 06 Collector: G 6/19/2018 3:56:0	ORDON CRANE 00 PM Method % solids %moisture 31918 CBS3 TS ORDON CRANE 00 PM	Date Collected: 6/19/2 Time Collected: 12:00 Due Date P 6/29/2018 <u>M</u> 6/29/2018 <u>M</u> Date Collected: 6/19/2 Time Collected: 12:00	2018 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 2018 PM
Recv'd: ✓ M Quantity: 1 1 Comment: 1 1 Test × 1 % SOLIDS × 1 %Moisture 18061 Recv'd: ✓ M Quantity: 1 1 Comment: 1 1	Iatrix: Solid Date Received: 6 9070-003 Customer S Iatrix: Solid 6 Date Received: 6	Collector: G 6/19/2018 3:56:0 Lab S S Sample #: 06 Collector: G 6/19/2018 3:56:0	ORDON CRANE 00 PM Method % solids %moisture 31918 CBS3 TS ORDON CRANE 00 PM	Date Collected: 6/19/2 Time Collected: 12:00 Due Date P 6/29/2018 <u>M</u> 6/29/2018 <u>M</u> Date Collected: 6/19/2 Time Collected: 12:00	2018 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 2018 PM
Recv'd: ✓ M Quantity: 1 1 Comment: 1 1 Test % 1 %Moisture 1 1 Sample #: 18061 Recv'd: ✓ M Quantity: 1 1 Comment: 1 1 Test 1 1	Iatrix: Solid Date Received: 6 9070-003 Customer S Iatrix: Solid 6 Date Received: 6	Collector: G 6/19/2018 3:56:0 Lab S S Sample #: 06 Collector: G 6/19/2018 3:56:0 Lab	ORDON CRANE 00 PM Method % solids %moisture 31918 CBS3 TS ORDON CRANE 00 PM Method	Date Collected: 6/19/2 Time Collected: 12:00 Due Date P 6/29/2018 <u>M</u> 6/29/2018 <u>M</u> Date Collected: 6/19/2 Time Collected: 12:00	2018 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 2018 PM
Recv'd: ✓ M Quantity: 1 1 Comment: 1 1 Test × 1 % SOLIDS × 1 %Moisture 1 1 Sample #: 18061 Recv'd: ✓ M Quantity: 1 1 Comment: 1 1 Test × 1 % SOLIDS × 1	Iatrix: Solid Date Received: 6 9070-003 Customer S Iatrix: Solid 6 Date Received: 6	Collector: G 6/19/2018 3:56:0 Lab S S Sample #: 06 Collector: G 6/19/2018 3:56:0 Lab S	ORDON CRANE D0 PM Method % solids %moisture 01918 CBS3 TS ORDON CRANE D0 PM Method % solids	Date Collected: 6/19/2 Time Collected: 12:00 Due Date P 6/29/2018 1 Date Collected: 6/19/2 Time Collected: 12:00 Date Collected: 12:00 Date Collected: 12:00 Date Collected: 6/19/2 Time Collected: 12:00 Due Date P 6/29/2018 12:00	2018 PM Priority Normal (~10 Days) Normal (~10 Days) 2018 PM Priority Normal (~10 Days)

Customer Name:	CITY OF ELLENSBURG	ì		Ord	er ID: 180619	070
	501 N ANDERSON ST			Order	Date: 6/19/2	018
	ELLENSBURG	WA	98926			
Contact Name:	JON MORROW			Project Name: S	STREET SWEEPING	VS
Comment:					CATCH BASIN	
Sample #: 1806190	070-004 Customer Sample #	#: 0619	18 CBS4 TS			
Recv'd: 🔽 Ma	trix: Solid Collecte	or: GOR	DON CRANE	Date Collected:	6/19/2018	
Quantity: 1	Date Received: 6/19/2018	8 3:56:00 F	PM	Time Collected:	12:00 PM	
Comment:						
		Lab	Method % solids	6/20/2018	Priority	
%Moisture		S	% solids	6/29/2018	<u>Normal (~10 Da</u>	<u>ys)</u>
		0	Juniolotare	0/20/2010	<u>Normai (~ 10 Da</u>	<u>ys)</u>
Sample #: 1806190	070-005 Customer Sample #	#: 0619	18 CBS5 CS			
Recv'd: 🖌 Ma	trix: Solid Collecte	or: GOR	DON CRANE	Date Collected:	6/19/2018	
Quantity: 1	Date Received: 6/19/2018	8 3:56:00 F	PM	Time Collected:	12:30 PM	
Comment:						
Test		l ah	Method	Due Date	Priority	
Test % SOLIDS		Lab S	Method % solids	Due Date 6/29/2018	Priority	vs)
Test % SOLIDS %Moisture		Lab S S	Method % solids %moisture	Due Date 6/29/2018 6/29/2018	Priority <u>Normal (~10 Da</u> <u>Normal (~10 Da</u>	i <u>vs)</u> ivs)
Test % SOLIDS %Moisture Sample #: 1806190	170-006 Customer Sample a	Lab S S	Method % solids %moisture	Due Date 6/29/2018 6/29/2018	Priority <u>Normal (~10 Da</u> <u>Normal (~10 Da</u>	i <u>ys)</u> iys)
Test % SOLIDS %Moisture Sample #: 1806190)70-006 Customer Sample ≉	Lab S S #: 0619	Method % solids %moisture 18 CBS6 CS	Due Date 6/29/2018 6/29/2018	Priority <u>Normal (~10 Da</u> <u>Normal (~10 Da</u>	<u>vs)</u> vs)
Test % SOLIDS %Moisture Sample #: 1806190 Recv'd: ☑ Ma	170-006 Customer Sample #	Lab S S #: 0619 pr: GOR	Method % solids %moisture 18 CBS6 CS CDON CRANE	Due Date 6/29/2018 6/29/2018 Date Collected:	Priority <u>Normal (~10 Da</u> <u>Normal (~10 Da</u> 6/19/2018	<u>vs)</u> vs)
Test % SOLIDS %Moisture Sample #: 1806190 Recv'd: ✔ Ma Quantity: 1	070-006 Customer Sample # trix: Solid Collecto Date Received: 6/19/2018	Lab S S #: 0619 or: GOR 3 3:56:00 F	Method % solids %moisture 18 CBS6 CS CDON CRANE PM	Due Date 6/29/2018 6/29/2018 Date Collected: Time Collected:	Priority <u>Normal (~10 Da</u> <u>Normal (~10 Da</u> 6/19/2018 12:45 PM	<u>ws)</u> w <u>s)</u>
Test % SOLIDS %Moisture Sample #: 1806190 Recv'd: ✓ Ma Quantity: 1 Comment: 1	070-006 Customer Sample # trix: Solid Collecto Date Received: 6/19/2018	Lab S S #: 0619 or: GOR 8 3:56:00 F	Method % solids %moisture 18 CBS6 CS CDON CRANE PM	Due Date 6/29/2018 6/29/2018 Date Collected: Time Collected:	Priority <u>Normal (~10 Da</u> <u>Normal (~10 Da</u> 6/19/2018 12:45 PM	1 <u>vs)</u> 1 <u>vs)</u>
Test % SOLIDS %Moisture Sample #: 1806190 Recv'd: ☑ Ma Quantity: 1 Comment: Test	070-006 Customer Sample # trix: Solid Collecto Date Received: 6/19/2018	Lab S S #: 0619 or: GOR 3 3:56:00 F Lab	Method % solids %moisture 18 CBS6 CS 2DON CRANE PM Method	Due Date 6/29/2018 6/29/2018 Date Collected: Time Collected: Due Date	Priority <u>Normal (~10 Da</u> <u>Normal (~10 Da</u> 6/19/2018 12:45 PM Priority	<u>ys)</u> <u>ys)</u>
Test % SOLIDS %Moisture Sample #: 1806190 Recv'd: ✓ Ma Quantity: 1 Comment: Test % SOLIDS % SOLIDS	070-006 Customer Sample # trix: Solid Collecto Date Received: 6/19/2018	Lab S S ≠: 0619 or: GOR 3 3:56:00 F Lab S	Method % solids %moisture 18 CBS6 CS DON CRANE PM Method % solids	Due Date 6/29/2018 6/29/2018 Date Collected: Time Collected: Due Date 6/29/2018	Priority <u>Normal (~10 Da</u> <u>Normal (~10 Da</u> 6/19/2018 12:45 PM Priority <u>Normal (~10 Da</u>	
Test % SOLIDS %Moisture Sample #: 1806190 Recv'd: ✓ Ma Quantity: 1 Comment: * SOLIDS %Moisture	070-006 Customer Sample # trix: Solid Collect Date Received: 6/19/2018	Lab S S #: 0619 or: GOR 3 3:56:00 F Lab S S	Method % solids %moisture 18 CBS6 CS DON CRANE PM Method % solids %moisture	Due Date 6/29/2018 6/29/2018 Date Collected: Time Collected: Due Date 6/29/2018 6/29/2018 6/29/2018 6/29/2018	Priority Normal (~10 Da Normal (~10 Da 6/19/2018 12:45 PM Priority Normal (~10 Da Normal (~10 Da	
Test % SOLIDS %Moisture Sample #: 1806190 Recv'd: ✓ Ma Quantity: 1 Comment: ✓ % SOLIDS % %Moisture ✓ Sample #: 1806190	070-006 Customer Sample # trix: Solid Collecto Date Received: 6/19/2018	Lab S S #: 0619 or: GOR 3 3:56:00 F Lab S S	Method % solids %moisture 18 CBS6 CS DON CRANE PM Method % solids %moisture 18 CBS7 CS	Due Date 6/29/2018 6/29/2018 Date Collected: Time Collected: Due Date 6/29/2018 6/29/2018	Priority Normal (~10 Da Normal (~10 Da 6/19/2018 12:45 PM Priority Normal (~10 Da Normal (~10 Da	1 <u>ys)</u> 1 <u>ys)</u> 1 <u>ys)</u> 1 <u>ys)</u>
Test % SOLIDS %Moisture Sample #: 1806190 Recv'd: ✓ Ma Quantity: 1 Comment: ✓ % SOLIDS % %Moisture ✓ Sample #: 1806190 %Moisture ✓ Sample #: 1806190 Recv'd: ✓ Ma	070-006 Customer Sample # trix: Solid Collecto Date Received: 6/19/2018 070-007 Customer Sample # trix: Solid Collecto	Lab S S vr: 0619 or: GOR 3 3:56:00 F Lab S S #: 0619 or: GOR	Method % solids %moisture 18 CBS6 CS DON CRANE PM Method % solids %moisture 18 CBS7 CS DON CRANE	Due Date 6/29/2018 6/29/2018 Date Collected: Time Collected: Due Date 6/29/2018 6/29/2018 6/29/2018 6/29/2018 Date Collected:	Priority Normal (~10 Da Normal (~10 Da 6/19/2018 12:45 PM Priority Normal (~10 Da Normal (~10 Da Normal (~10 Da 6/19/2018	ys) ys) ys) ys)
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		ELI	ENSBURG	6	WA	98926			
Contact	Nar	ne: JOI	N MORROV	V			Project Name:	STREET S	SWEEPING VS
Cor	nme	nt:					- ((CATCH BANING	ASIN
							·	0227 (14)	
Sample #:	180	619070-0	08 Custom	er Sample #:	COM	POSITE 061918 CB	S1,2,3,4 TS		
Recv'd:	✓	Matrix:	Solid	Collector:	GOR	DON CRANE	Date Collected:	6/19/2018	
Quantity:	1	Da	te Received:	6/19/2018 3:	56:00 F	PM	Time Collected:		
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	504 E Sprague St	e D, Spokane	WA 99202 (5	09) 838-3999 FAX	& 838-44	33	0	
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August 2018 Data Collection Event

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	CITY OF ELLENSBURG	Batch #:	180831032
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	180831032-001 082318SSTS1 Solid		Sampling Date Sampling Time Sample Location	8/30/2018 10:45 AM	Date/Ti Extract	me Received ion Date	8/31/2018	1:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		16.2	%	0.1	9/5/2018 10:30:00 AM	BAS	% solids	
TVS		5.8	%	0.01	9/5/2018 10:30:00 AM	BAS	SM2540E	
%moisture		16.2	Percent		9/5/2018	BAS	%moisture	

Sam Clier Matr Com	ple Number nt Sample ID ix ments	180831032-002 082318SSTS2 Solid		Sampling Date Sampling Time Sample Location	8/30/2018 10:45 AM	Date/Ti Extract	me Received ion Date	8/31/2018	1:14 PM
	Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
	% solids		15.3	%	0.1	9/5/2018 10:30:00 AM	BAS	% solids	
	TVS		6.2	%	0.01	9/5/2018 10:30:00 AM	BAS	SM2540E	
	%moisture		15.3	Percent		9/5/2018	BAS	%moisture	

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Client:CITY OF ELLENSBURGBatch #:180831032Address:1401 E TRENT AVE, SUITE 101
SPOKANE, WA 99202Project Name:STREET SWEEPING VS
CATCH BASINAttn:JON MORROWVV

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	180831032-003 082318SSTS3 Solid		Sampling Date Sampling Time Sample Location	8/30/2018 10:45 AM	Date/Ti Extract	me Received ion Date	8/31/2018	1:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		15.8	%	0.1	9/5/2018 10:30:00 AM	BAS	% solids	
TVS		5.6	%	0.01	9/5/2018 10:30:00 AM	BAS	SM2540E	
%moisture		15.8	Percent		9/5/2018	BAS	%moisture	

Sample Number Client Sample ID Matrix Comments	180831032-004 082318CBTS1 Solid		Sampling Date Sampling Time Sample Locatior	8/30/2018 10:25 AM	Date/Ti Extract	me Received ion Date	8/31/2018	1:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		56.8	%	0.1	9/5/2018 10:30:00 AM	BAS	% solids	
TVS		30.7	%	0.01	9/5/2018 10:30:00 AM	BAS	SM2540E	
%moisture		56.8	Percent		9/5/2018	BAS	%moisture	

Sample Number Client Sample ID Matrix Comments	180831032-005 082318CBTS2 Solid		Sampling Date Sampling Time Sample Location	8/30/2018 10:25 AM	Date/Ti Extract	me Received ion Date	8/31/2018	1:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		45.4	%	0.1	9/5/2018 10:30:00 AM	BAS	% solids	
TVS		17.4	%	0.01	9/5/2018 10:30:00 AM	BAS	SM2540E	
%moisture		45.4	Percent		9/5/2018	BAS	%moisture	

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Client:CITY OF ELLENSBURGBatch #:Address:1401 E TRENT AVE, SUITE 101Project NSPOKANE, WA 99202SPOKANE, WA 99202Attn:JON MORROW

Batch #: 180831032 Project Name: STREET SWEEPING VS CATCH BASIN

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	180831032-006 082318CBTS3 Solid		Sampling Date Sampling Time Sample Locatior	8/30/2018 10:25 AM	Date/Ti Extract	me Received ion Date	8/31/2018	1:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		61.0	%	0.1	9/5/2018 10:30:00 AM	BAS	% solids	
TVS		39.7	%	0.01	9/5/2018 10:30:00 AM	BAS	SM2540E	
%moisture		61	Percent		9/5/2018	BAS	%moisture	

Sample Number Client Sample ID Matrix Comments	180831032-007 082318CBCS1 Solid		Sampling Date Sampling Time Sample Location	8/30/2018 10:30 AM	Date/Ti Extract	me Received ion Date	8/31/2018	1:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		42.6	%	0.1	9/5/2018 10:30:00 AM	BAS	% solids	
TVS		19.6	%	0.01	9/5/2018 10:30:00 AM	BAS	SM2540E	
%moisture		42.6	Percent		9/5/2018	BAS	%moisture	

Sample Number Client Sample ID Matrix Comments	180831032-008 082318CBCS2 Solid		Sampling Date Sampling Time Sample Location	8/30/2018 10:30 AM	Date/Ti Extract	me Received ion Date	8/31/2018	1:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		41.7	%	0.1	9/5/2018 10:30:00 AM	BAS	% solids	
TVS		16.9	%	0.01	9/5/2018 10:30:00 AM	BAS	SM2540E	
%moisture		41.7	Percent		9/5/2018	BAS	%moisture	

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Client:CITY OF ELLENSBURGAddress:1401 E TRENT AVE, SUITE 101
SPOKANE, WA 99202Attn:JON MORROW

Batch #: 180831032 Project Name: STREET SV CATCH BA

STREET SWEEPING VS CATCH BASIN

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	180831032-009 082318CBCS3 Solid		Sampling Date Sampling Time Sample Location	8/30/2018 10:30 AM	Date/Ti Extract	me Received ion Date	8/31/2018	1:14 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		62.4	%	0.1	9/5/2018 10:30:00 AM	BAS	% solids	
TVS		37.7	%	0.01	9/5/2018 10:30:00 AM	BAS	SM2540E	
%moisture		62.4	Percent		9/5/2018	BAS	%moisture	

Authorized Signature

Kathleen a

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated. Soil/solid results are reported on a dry-weight basis unless otherwise noted.



Proudly serving the Inland Northwest since 1976

September 24, 2018

Kathy Sattler Anatek Labs, Inc 504 E Sprague Ave Ste D Spokane, WA 99202

Project Number L18532

PROJECT: City of Ellensburg QAPP

SUBJECT: Results of Laboratory Testing Report #2

At your request, we provided laboratory testing services for the subject project. Services were limited to the performance of testing of laboratory tests, selected at your discretion.

For this period, our involvement was limited to laboratory testing of three two delivered to our laboratory on September 14, 2018. Laboratory tests were conducted in general accordance with methods listed on the attached Laboratory *Summary* sheet.

If you have questions regarding this report, please call.

Respectfully Submitted, Budinger & Associates, Inc.

mi Ballard

Terri Ballard Laboratory Manager

TJB/kh/Addressee – Kathy Sattler-<u>kathys@anateklabs.com</u>

Attachments: Soils Laboratory Summary - (1 page)

4-5-6 and 7-8-9 refer

to numbers on left-hand side of COC

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SOILS	
LABORATORY SUMMARY	

				061918CBSTS	061918CBSCS	061918SSTS	082318CBTS	082318CBCS
LABORATORY NUMBER				18-0607	18-0608	18-0609	18-0856	18-0857
PROJECT SAMPLE NUMBER	R			180619070-008	180619070-009	180706055-010	180831032	180831032
							004-005-006	007-008-009
SAMPLED BY				Client	Client	Client	Client	Client
SAMPLE TYPE				Bulk	Bulk	Bulk	Bulk	Bulk
DATE RECEIVED				7/26/18	7/26/18	7/26/18	9/14/18	9/14/18
				North	South	North	North	South
		Units	Test Method	Horan	Couli		North	Coun
MOISTURE CONTENT		%		1.8	1.5	5.5	1.2	1.2
SIEVE ANALYSIS			ASTM D422					
	1"						100	
	3/4"					100	100-	
S	1/2"	%			100	99	98	100
Ι	3/8"			100	99	95	95	99
E	1/4"	Р		95	97	88	89	93
V	#10	Α		86	78	56	65	67
E	#16	S		83	73	40	56	58
	#30	S		81	69	22	41	46
S	#40	Ι		80	68	16	35	39
Ι	#100	Ν		76	61	8	17	22
Z	#200	G		73	55	5.3	9.8	15
E	.05mm			72	47	5.2	7.7	12
	.01mm			46	27	2.9	2.5	4.6
	.005mm			22	15	2.3	1.3	3.5
	.001mm			5.0	2.4	1.0	1.3	1.7

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Login Report

Customer Name: CITY OF ELLENSBUR	G		Order ID:	180831032
1401 E TRENT AVE, S	SUITE 10	1	Order Date:	8/31/2018
SPOKANE	W	A 99202		
Contact Name: JON MORROW			Project Name: STREET	SWEEPING VS
Comment: PSD SUBCONTRACT	ED TO B	UDINGER	CATCH E	BASIN
Sample #: 180831032-001 Customer Sample	e #: 0823	18SSTS1		
Recv'd: 🔽 Matrix: Solid Collec	ctor: GOI	RDON CRANE	Date Collected: 8/30/201	8
Quantity: 1 Date Received: 8/31/20	018 1:14:00	PM	Time Collected: 10:45 AM	И
Comment:				
Test	Lab	Method	Due Date Price	ority
% SOLIDS	S	% solids	9/13/2018 <u>No</u>	rmal (~10 Days)
%Moisture	S	%moisture	9/13/2018 <u>No</u>	<u>rmal (~10 Days)</u>
SOLIDS - TVS	S	SM2540E	9/13/2018 <u>No</u>	<u>rmal (~10 Days)</u>
Sample #: 180831032-002 Customer Sample	e #: 08231	18SSTS2		
Recv'd: V Matrix: Solid Collect	ctor: GO	RDON CRANE	Date Collected: 8/30/201	8
Recv'd:Matrix:SolidCollectQuantity:1Date Received:8/31/20	ctor: GOI	RDON CRANE PM	Date Collected:8/30/201Time Collected:10:45 AM	8 M
Recv'd:Matrix:SolidCollectQuantity:1Date Received:8/31/20Comment:	ctor: GOI	RDON CRANE PM	Date Collected:8/30/201Time Collected:10:45 AM	8 M
Recv'd: Matrix: Solid Collect Quantity: 1 Date Received: 8/31/20 Comment:	ctor: GOI	PM	Date Collected:8/30/201Time Collected:10:45 AN	8 //
Recv'd: Matrix: Solid Collect Quantity: 1 Date Received: 8/31/20 Comment: Test	ctor: GOI 018 1:14:00 Lab	RDON CRANE PM Method	Date Collected: 8/30/201 Time Collected: 10:45 AM	8 M prity
Recv'd: Matrix: Solid Collect Quantity: 1 Date Received: 8/31/20 Comment: * * * * * * % SOLIDS * *	ctor: GOI 018 1:14:00 Lab S	RDON CRANE PM Method % solids	Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Prior 9/13/2018 No	8 M prity <u>rmal (~10 Days)</u>
Recv'd: Matrix: Solid Collect Quantity: 1 Date Received: 8/31/20 Comment: ************************************	ctor: GOI 018 1:14:00 Lab S S	RDON CRANE PM Method % solids %moisture	Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Prior 9/13/2018 No 9/13/2018 No 0/13/2018 No	8 M prity <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u>
Recv'd: Matrix: Solid Collect Quantity: 1 Date Received: 8/31/20 Comment: * * * * * * % SOLIDS * * % SOLIDS - TVS * *	ctor: GOI 018 1:14:00 Lab S S S S	RDON CRANE PM Method % solids %moisture SM2540E	Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Priod 9/13/2018 No 9/13/2018 No 9/13/2018 No 9/13/2018 No 9/13/2018 No	8 M prity <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u>
Recv'd: ✓ Matrix: Solid College Quantity: 1 Date Received: 8/31/20 Comment: - - - Test - - - % SOLIDS - - - %Moisture - - - SOLIDS - TVS - - - Sample #: 180831032-003 Customer Sample -	ctor: GOI 018 1:14:00 Lab S S S e #: 0823	RDON CRANE PM Method % solids %moisture SM2540E 118SSTS3	Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Prio 9/13/2018 No 9/13/2018 No 9/13/2018 No 9/13/2018 No	8 M <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u>
Recv'd: ✓ Matrix: Solid College Quantity: 1 Date Received: 8/31/20 Comment: 8/31/20 Test % SOLIDS %Moisture SOLIDS - TVS Customer Sample Recv'd: ✓ Matrix: Solid College	ctor: GOI 018 1:14:00 Lab S S S e #: 0823 ctor: GOI	RDON CRANE PM Method % solids %moisture SM2540E 18SSTS3 RDON CRANE	Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Prio 9/13/2018 No	8 M prity <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> 8
Recv'd: ✓ Matrix: Solid College Quantity: 1 Date Received: 8/31/20 Comment: - - - Test - - - % SOLIDS - - - %Moisture - - - SOLIDS - TVS - - - Sample #: 180831032-003 Customer Sample - Recv'd: ✓ Matrix: Solid College Quantity: 1 Date Received: 8/31/20	ctor: GOI 018 1:14:00 Lab S S S e #: 0823 ctor: GOI 018 1:14:00	RDON CRANE PM Method % solids %moisture SM2540E 1/8SSTS3 RDON CRANE PM	Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Prior 9/13/2018 No 10:45 AM 10:45 AM	8 A prity <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> 8 A
Recv'd: ✓ Matrix: Solid College Quantity: 1 Date Received: 8/31/20 Comment: - - - Test - - - % SOLIDS - - - %Moisture - - - SOLIDS - TVS - - - Sample #: 180831032-003 Customer Sample - Quantity: 1 Date Received: 8/31/20 Comment: - - - -	ctor: GOI 018 1:14:00 Lab S S S e #: 0823 ctor: GOI 018 1:14:00	RDON CRANE PM Method % solids %moisture SM2540E 218SSTS3 RDON CRANE PM	Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Prio 9/13/2018 No 10:45 AM No	8 M <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> 8 M
Recv'd: ✓ Matrix: Solid College Quantity: 1 Date Received: 8/31/20 Comment:	ctor: GOI 018 1:14:00 Lab S S S e #: 0823 ctor: GOI 018 1:14:00 Lab	RDON CRANE PM Method % solids %moisture SM2540E 218SSTS3 RDON CRANE PM Method	Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Prio 9/13/2018 No Date Collected: 8/30/201 Time Collected: 10:45 AM	8 A prity <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> 8 A
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Recv'd: ✓ Matrix: Solid College Quantity: 1 Date Received: 8/31/20 Comment:	ctor: GOI 018 1:14:00 Lab S S S e #: 0823 ctor: GOI 018 1:14:00 Lab S S S	RDON CRANE PM Method % solids %moisture SM2540E 1/8SSTS3 RDON CRANE PM Method % solids %moisture SM2540F	Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Priot 9/13/2018 No 9/13/2018 No 9/13/2018 No 9/13/2018 No 9/13/2018 No 9/13/2018 No Date Collected: 8/30/201 Time Collected: 10:45 AM Due Date Priot 9/13/2018 No 9/13/2018 No 9/13/2018 No 9/13/2018 No	8 A brity <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> 8 A brity <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u> <u>rmal (~10 Days)</u>

1401 E TRENT AVE, SUITE 101 Order Date: 8/31/2018 SPOKANE 99202 WA Project Name: STREET SWEEPING VS CATCH BASIN Contact Name: JON MORROW Comment: PSD SUBCONTRACTED TO BUDINGER Sample #: 180831032-004 Customer Sample #: 082318CBTS1 Recv'd: Matrix: Solid Collector: GORDON CRANE **Date Collected:** 8/30/2018 \checkmark 8/31/2018 1:14:00 PM **Time Collected:** Quantity: 1 Date Received: 10:25 AM Comment: Test Method Due Date Lab Priority % SOLIDS S % solids 9/13/2018 Normal (~10 Days) S %Moisture %moisture 9/13/2018 Normal (~10 Days) SOLIDS - TVS s SM2540E 9/13/2018 Normal (~10 Days) Sample #: 180831032-005 Customer Sample #: 082318CBTS2 Collector: GORDON CRANE Recv'd: \checkmark Matrix: Solid Date Collected: 8/30/2018 Quantity: 1 Date Received: 8/31/2018 1:14:00 PM **Time Collected:** 10:25 AM Comment: Test Lab Method **Due Date** Priority % SOLIDS S % solids 9/13/2018 Normal (~10 Days) %Moisture S 9/13/2018 %moisture Normal (~10 Days) SOLIDS - TVS S SM2540E 9/13/2018 Normal (~10 Days) Sample #: 180831032-006 Customer Sample #: 082318CBTS3 Recv'd: Matrix: Solid Collector: GORDON CRANE **Date Collected:** 8/30/2018 \checkmark 8/31/2018 1:14:00 PM 10:25 AM Quantity: 1 Date Received: Time Collected: Comment: Method **Due Date** Priority Test Lab % SOLIDS S % solids 9/13/2018 Normal (~10 Days) S %Moisture 9/13/2018 %moisture Normal (~10 Days) SOLIDS - TVS S SM2540E 9/13/2018 Normal (~10 Days) Sample #: 180831032-007 Customer Sample #: 082318CBCS1 Collector: GORDON CRANE 8/30/2018 Recv'd: Matrix: Solid **Date Collected:** ~ Quantity: Date Received: 8/31/2018 1:14:00 PM **Time Collected:** 10:30 AM 1 Comment: Test Lab Method **Due Date** Priority % SOLIDS S 9/13/2018 % solids Normal (~10 Days)

Order ID:

180831032

Customer Name: CITY OF ELLENSBURG

Customer Name: Cl	TY OF ELLENSBURG			Orde	er ID:	180831032
14 SF	01 E TRENT AVE, SUI POKANE	TE 10 W	1 A 99202	Order	Date:	8/31/2018
Contact Name: JO	N MORROW			Project Name: S	TREET S	WEEPING VS
Comment: PS	D SUBCONTRACTED	тов	UDINGER	C	АТСН ВА	SIN
		_				
%Moisture		S	%moisture	9/13/2018	Norm	<u>nal (~10 Days)</u>
SOLIDS - TVS		5	SM2540E	9/13/2018	Norm	<u>nal (~10 Days)</u>
Sample #: 180831032-0	008 Customer Sample #:	082	318CBCS2			
Recv'd: 🖌 Matrix:	Solid Collector	: GOF	RDON CRANE	Date Collected:	8/30/2018	
Quantity: 1 Da	ate Received: 8/31/2018	1:14:00	PM	Time Collected:	10:30 AM	
Comment:						
Test		Lah	Method	Due Date	Priorit	hz
% SOLIDS		S	% solids	9/13/2018	Norm	nal (~10 Davs)
%Moisture		S	%moisture	9/13/2018	Norm	nal (~10 Davs)
SOLIDS - TVS		S	SM2540E	9/13/2018	Norm	nal (~10 Days)
		_				
Sample #: 180831032-0	009 Customer Sample #:	082	31808053			
Sample #: 180831032-0	009 Customer Sample #:	082	318CBCS3			
Sample #: 180831032-0 Recv'd:	009 Customer Sample #: Solid Collector	082	318CBCS3	Date Collected:	8/30/2018	
Sample #: 180831032-0 Recv'd: V Matrix: Quantity: 1 Da	009 Customer Sample #: : Solid Collector ate Received: 8/31/2018	082 GOF 1:14:00	318CBCS3 RDON CRANE PM	Date Collected: Time Collected:	8/30/2018 10:30 AM	
Sample #: 180831032-0 Recv'd:	009 Customer Sample #: : Solid Collector ate Received: 8/31/2018	082 GOF 1:14:00	318CBCS3 RDON CRANE PM	Date Collected: Time Collected:	8/30/2018 10:30 AM	
Sample #: 180831032-0 Recv'd: Comment: Test	009 Customer Sample #: Solid Collector ate Received: 8/31/2018	082 GOF 1:14:00	318CBCS3 RDON CRANE PM Method	Date Collected: Time Collected: Due Date	8/30/2018 10:30 AM Priorit	ty
Sample #: 180831032-0 Recv'd: Matrix: Quantity: 1 Da Comment: Test % SOLIDS	009 Customer Sample #: Solid Collector ate Received: 8/31/2018	082 : GOF 1:14:00 Lab S	318CBCS3 RDON CRANE PM Method % solids	Date Collected: Time Collected: Due Date 9/13/2018	8/30/2018 10:30 AM Priorit	ty nal (~10 Days)
Sample #: 180831032-0 Recv'd: ✓ Matrix: Quantity: 1 Da Comment: <u>Test</u> % SOLIDS %Moisture	009 Customer Sample #: Solid Collector ate Received: 8/31/2018	082 -: GOF 1:14:00 Lab S S	318CBCS3 RDON CRANE PM Method % solids %moisture	Date Collected: Time Collected: Due Date 9/13/2018 9/13/2018	8/30/2018 10:30 AM Priorit <u>Norm</u> <u>Norm</u>	ty nal (~10 Days) nal (~10 Days)
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	Labs,	Q 1282 A	Ituras Drive.	Mose	ow II	838	43 (208)	883-2	2839 FA	XS	882-9246	0	STREET SWEEPING VS CATCH
	Inc.	○ 504 E Sp	rague Ste D,	Spok	ane V	A 99	9202	(509) 838	8-3999 1	FAX	838-44	33 🔾	EASIN
Compa	ny Name:	City of Ellensbu	ra	Proje	ect Mar	nager:				Jon M	orre	ow		Full Fround Fine & Reporting
Addres	s: 1401	E Trant Ava Suita	101	Proje	ect Nar	ne &	#:	Stro	ot S	weenin	a ve	Catch	Basin	Please refer to our normal turn around times at: http://www.apateklabs.com/services/quidelines/reporting.asp
City	1401	State: wa Zip:		Ema	il Addr	ess :		ouc		neepin	9	, outon	Dusin	< Normal tan based of the second of the seco
Oity.	Spokane	WA	99202	0	C		и.	mor	rowj	@ci.ell	ens	burg.wa	a.us	Next Day* requests must beMail
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and the second	Provide	Sample Description	n "Server af the				List	Ana	lyse	es Requ	est	ed		Note Special Instructions/Comments
	Catch b	asin and street sediment		Press	ervativa-		-		-	+	+			Please send a copy of the results to
				ainer	olun	ontent 216	D422	nlent 974	S			-		Jon at email above and Aimee at
				Conta	le V	MD2	VISTM	M D2	P					aimee.navickis-brasch@hdrinc.com
Lab		Consultan Data (Tima	Matrix	of O	amp	Molsti	PSD /	Organ						
ID	082318SSTS1	0_2018 1.45 AN	solid		40Z	×	-	×	1		+			For ASTM D422 testing, combine all 082218CBTS
2.	082318SSTS2	0.00000000	solid	1	1	×		×						samples, then combine all 082218CBCS samples and use
3	082318SSTS3	61	solid	1		×		×			Τ			the following sieve sizes:
4	082318CBTS1	10:25 AM	solid	1		×	×	×						>2mm, 0.25-2mm, 0.075-0.25mm, <0,075 mm
5	082318CBTS2	ч	solid	1		×		×			_			CUBS
6	082318CBTS3	.(solid	1		×		×	-		+			5W125
7	082318CBCS1	10:30 AM	solid	1		×	×	×	-		-	21 B 1		B(1) - YSD
8	082318CBCS2		solid	1		×	-	×	k.	-	+		i ro	Received Intent?
9	082318CBCS3	v u	solid	1	~	<u>^</u>		1^	-		+			Labels & Chains Agree?
San and				+		-					+			Containers Sealed? N N
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State Provident									Maria			1.00		and the
The State	P	rinted Name	Signature	11) n sist	and the second		Con	ipany		C	Date	Time	UP5/C/1 1
Relino	uished by	Eardon Crane	Marian	10	an	-		City	y of	Fleusbe	me	3-30-18	1:55	Temperature (°C): <u>9.3/9.4</u> IR
Pacai	ved by	Naudu A7	Malk	MN	1,1	h		V	Ino	top	18	3-3/-12	174	Preservative:
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Relind	quished by	U			~	\smile								Date & Time: 8-31-18 1314
Recei	ved by							-	-		+			
Relind	quished by										-	· ·		Inspected By:
Recei	ved by								1			99		

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	CITY OF ELLEN	SBURG			Batch #:	18082802	2	
Address:	1401 E TRENT	AVE, SUI	TE 101		Project Name:	STREET S	SWEEPING	SVS
	SPOKANE, WA	99202			•	CATCH B	ASIN	
Attn:	JON MORROW							
,	••••							
			Analytical R	esults R	eport			
Sample Number	180828022-001		Sampling Date	8/23/2018	Date/	Fime Received	8/28/2018	12:46 PM
Client Sample ID	082318CBS1 TS		Sampling Time	11:00 AM	Extra	ction Date		
Matrix	Solid		Sample Location	n				
Comments								
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		94.1	%	0.1	8/30/2018	CME	% solids	
%moisture		5.9	%	••••	8/30/2018	CME	%moisture	
Sample Number	180828022-002	_	Sampling Date	8/23/2018	Date/	Time Received	8/28/2018	12:46 PM
Client Sample ID	082318CBS2 TS		Sampling Time	11:00 AM	Extra	ction Date		
Matrix	Solid		Sample Location	n				
Comments								
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Parameter % solids		Result 95.1	Units %	PQL 0.1	Analysis Date 8/30/2018	Analyst CME	Method % solids	Qualifier
Parameter % solids %moisture		Result 95.1 4.9	Units % %	PQL 0.1	Analysis Date 8/30/2018 8/30/2018	Analyst CME CME	Method % solids %moisture	Qualifier
Parameter % solids %moisture		Result 95.1 4.9	Units % %	PQL 0.1	Analysis Date 8/30/2018 8/30/2018	Analyst CME CME	Method % solids %moisture	Qualifier
Parameter % solids %moisture Sample Number	180828022-003	Result 95.1 4.9	Units % % Sampling Date	PQL 0.1 8/23/2018	Analysis Date 8/30/2018 8/30/2018 Date/	Analyst CME CME	Method % solids %moisture 8/28/2018	Qualifier 12:46 PM
Parameter % solids %moisture Sample Number Client Sample ID	180828022-003 082318CBS3 TS	Result 95.1 4.9	Units % % Sampling Date Sampling Time	PQL 0.1 8/23/2018 11:00 AM	Analysis Date 8/30/2018 8/30/2018 Date/ Extrac	Analyst CME CME Fime Received	Method % solids %moisture 8/28/2018	Qualifier 12:46 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments	180828022-003 082318CBS3 TS Solid	Result 95.1 4.9	Units % % Sampling Date Sampling Time Sample Location	PQL 0.1 8/23/2018 11:00 AM	Analysis Date 8/30/2018 8/30/2018 Date/ Extrac	Analyst CME CME Fime Received	Method % solids %moisture 8/28/2018	Qualifier 12:46 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments	180828022-003 082318CBS3 TS Solid	Result 95.1 4.9	Units % % Sampling Date Sampling Time Sample Location	PQL 0.1 8/23/2018 11:00 AM n	Analysis Date 8/30/2018 8/30/2018 Date/T Extrac	Analyst CME CME Time Received	Method % solids %moisture 8/28/2018	Qualifier 12:46 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter	180828022-003 082318CBS3 TS Solid	Result 95.1 4.9	Units % % Sampling Date Sampling Time Sample Location Units	PQL 0.1 8/23/2018 11:00 AM n PQL	Analysis Date 8/30/2018 8/30/2018 Date/ Extrac Analysis Date	Analyst CME CME Fime Received ction Date Analyst	Method % solids %moisture 8/28/2018 Method	Qualifier 12:46 PM Qualifier
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Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture	180828022-003 082318CBS3 TS Solid	Result 95.1 4.9 9 0	Units % % Sampling Date Sample Location Units % %	PQL 0.1 8/23/2018 11:00 AM n PQL 0.1	Analysis Date 8/30/2018 8/30/2018 Date/ Extrac Analysis Date 8/30/2018 8/30/2018	Analyst CME CME Time Received ction Date Analyst CME CME	Method % solids %moisture 8/28/2018 8/28/2018 Method % solids %moisture	Qualifier 12:46 PM Qualifier
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture	180828022-003 082318CBS3 TS Solid	Result 95.1 4.9 9 Besult 92.5 7.5	Units % % Sampling Date Sampling Time Sample Location Units % %	PQL 0.1 8/23/2018 11:00 AM n PQL 0.1	Analysis Date 8/30/2018 8/30/2018 Date/ Extrac Analysis Date 8/30/2018 8/30/2018	Analyst CME CME Time Received ction Date Analyst CME CME	Method % solids %moisture 8/28/2018 Method % solids %moisture	Qualifier 12:46 PM Qualifier
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number	180828022-003 082318CBS3 TS Solid 180828022-004	Result 95.1 4.9	Units % % Sampling Date Sample Location Units % % Sampling Date	PQL 0.1 8/23/2018 11:00 AM PQL 0.1 8/23/2018	Analysis Date 8/30/2018 8/30/2018 Date/ Extrac Analysis Date 8/30/2018 8/30/2018 00000000000000000000000000000000000	Analyst CME CME Time Received ction Date Analyst CME CME	Method % solids %moisture 8/28/2018 Method % solids %moisture 8/28/2018	Qualifier 12:46 PM Qualifier 12:46 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix	180828022-003 082318CBS3 TS Solid 180828022-004 082318CBS4 TS Solid	Result 95.1 4.9	Units % % Sampling Date Sample Location Units % % Sampling Date Sampling Date Sampling Time	PQL 0.1 8/23/2018 11:00 AM PQL 0.1 8/23/2018 11:00 AM	Analysis Date 8/30/2018 8/30/2018 Date/ Extrac Analysis Date 8/30/2018 8/30/2018 8/30/2018 Cate/ Extrac	Analyst CME CME Time Received ction Date Analyst CME CME Time Received ction Date	Method % solids %moisture 8/28/2018 Method % solids %moisture 8/28/2018	Qualifier 12:46 PM Qualifier 12:46 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments	180828022-003 082318CBS3 TS Solid 180828022-004 082318CBS4 TS Solid	Result 95.1 4.9	Units % % Sampling Date Sample Location Units % % Sampling Date Sampling Date Sampling Time Sample Location	PQL 0.1 8/23/2018 11:00 AM PQL 0.1 8/23/2018 11:00 AM n	Analysis Date 8/30/2018 8/30/2018 Date/T Extrac Analysis Date 8/30/2018 8/30/2018 Date/T Extrac	Analyst CME CME Time Received ction Date Analyst CME CME Time Received ction Date	Method % solids %moisture 8/28/2018 Method % solids %moisture	Qualifier 12:46 PM Qualifier 12:46 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments	180828022-003 082318CBS3 TS Solid 180828022-004 082318CBS4 TS Solid	Result 95.1 4.9 9 9 9 92.5 7.5	Units % % Sampling Date Sample Location Units % % Sampling Date Sampling Time Sample Location	PQL 0.1 8/23/2018 11:00 AM 0.1 8/23/2018 11:00 AM n	Analysis Date 8/30/2018 8/30/2018 Date/T Extrac 8/30/2018 8/30/2018 8/30/2018 Date/T Extrac	Analyst CME CME Time Received ction Date Analyst CME CME CME	Method % solids %moisture 8/28/2018 Method % solids %moisture 8/28/2018	Qualifier 12:46 PM Qualifier 12:46 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter	180828022-003 082318CBS3 TS Solid 180828022-004 082318CBS4 TS Solid	Result 95.1 4.9 9 <td< th=""><th>Units % % Sampling Date Sample Location Units % % Sampling Date Sampling Time Sample Location</th><th>PQL 0.1 8/23/2018 11:00 AM PQL 0.1 8/23/2018 11:00 AM</th><th>Analysis Date 8/30/2018 8/30/2018 Date/ Extrac Analysis Date 8/30/2018 8/30/2018 Cate/ Extrac Date/ Extrac Analysis Date Cate/ Extrac</th><th>Analyst CME CME Time Received ction Date Analyst CME CME Time Received ction Date</th><th>Method % solids %moisture 8/28/2018 Method % solids %moisture 8/28/2018</th><th>Qualifier 12:46 PM Qualifier 12:46 PM</th></td<>	Units % % Sampling Date Sample Location Units % % Sampling Date Sampling Time Sample Location	PQL 0.1 8/23/2018 11:00 AM PQL 0.1 8/23/2018 11:00 AM	Analysis Date 8/30/2018 8/30/2018 Date/ Extrac Analysis Date 8/30/2018 8/30/2018 Cate/ Extrac Date/ Extrac Analysis Date Cate/ Extrac	Analyst CME CME Time Received ction Date Analyst CME CME Time Received ction Date	Method % solids %moisture 8/28/2018 Method % solids %moisture 8/28/2018	Qualifier 12:46 PM Qualifier 12:46 PM
Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids	180828022-003 082318CBS3 TS Solid 180828022-004 082318CBS4 TS Solid	Result 95.1 4.9 9 9 9 92.5 7.5	Units % % Sampling Date Sample Location Units % % Sampling Date Sampling Time Sample Location Units %	PQL 0.1 8/23/2018 11:00 AM PQL 0.1 8/23/2018 11:00 AM n PQL 0.1	Analysis Date 8/30/2018 8/30/2018 Date/T Extrac Analysis Date 8/30/2018 8/30/2018 Date/T Extrac Analysis Date 8/30/2018	Analyst CME CME Time Received ction Date Analyst CME CME Time Received ction Date	Method % solids %moisture 8/28/2018 Method % solids %moisture 8/28/2018	Qualifier 12:46 PM Qualifier 12:46 PM

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Client:	CITY OF ELLENSBURG	Batch #:	180828022
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	180828022-005 082318CBS5 CS Solid]	Sampling Date Sampling Time Sample Location	8/23/2018 11:00 AM n	Date, Extra	Time Received	8/28/2018	12:46 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		93.1 6.9	% %	0.1	8/30/2018 8/30/2018	CME CME	% solids %moisture	
Sample Number Client Sample ID Matrix Comments	180828022-006 082318CBS6 CS Solid		Sampling Date Sampling Time Sample Location	8/23/2018 11:00 AM n	Date, Extra	Time Received action Date	8/28/2018	12:46 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		88.8	%	0.1	8/30/2018	CME	% solids	
%moisture		11.2	%		8/30/2018	CME	%moisture	
Sample Number Client Sample ID Matrix Comments	180828022-007 082318CBS7 CS Solid]	Sampling Date Sampling Time Sample Location	8/23/2018 11:00 AM n	Date, Extra	Time Received action Date	8/28/2018	12:46 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		94.4	%	0.1	8/30/2018	CME	% solids	
%moisture		1.91	%		8/30/2018	CME	%moisture	
Authorized Signature	Kathleen A.	Sattler, Lab N	Aanager					
MCL EPA's Maxim ND Not Detected POL Practical Out	um Contaminant Level							

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated.

Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Sample Extraction Logbook

%Moisture instructions: Determine the percent moisture for each solid sample by oven drying about 10.0g of sample at 105°C for 2 hours. Allow to cool in a dessicator and re-weigh. Oven dry for an additional 30 minutes and re-weigh. Further drying is necessary if the two weighings differ by more than 1%.

.

	Dish	Dish wt	Dish +	Dry 1	Dry 2	%										
Lab Sample ID	ID	(g)	wet (g)	(g)	(g)	moisture	Sample	Weight	(g)	Meth	nod	Balance	Date	/Time	Init	ials
082318CBS1 TS	Socies	280	292.50	291.76	291.76	5.9		NA		7. M	visture	BAL-2	8-30-18	1400	KAS	S
082318CBS2 TS		284	297.53	296.86	296.88	21.9		1							1	
082318CBS3 TS		280	295.11	2921.32	293.98	7.5		1				*				
082318CBS4 TS		282	296.02	295.35	295.04	7.0										
082318CBS5 CS		280	288.43	287.88	287.85	6.9										
082318CBS6 CS		282	286.72	286.22	286.19	11.2										
082318CBS7 CS	1	280	295.89	295.27	295.00	5,6				7	-	1	1	0	-	L
			•													
								10.10								
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						Les l'artice										
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Login Report

Customer	Name:	CITY C	OF ELLEN	ISBURG				Orc	ler ID	: 180828022
		1401 E SPOKA	TRENT /	AVE, SUIT	E 101 WA	l A 99:	202	Order	Date	: 8/28/2018
Contact Con	Name: nment:	JON M	ORROW					Project Name:	STREI CATCI	ET SWEEPING VS H BASIN
Sample #:	180828	022-001	Customer	Sample #:	08231	18CBS1 TS				
Recv'd:	✓ Ma	trix: Soli	id	Collector:	GOR	DON CRANE		Date Collected:	8/23/2	2018
Quantity:	1	Date Re	eceived:	8/28/2018 1	2:46:00	PM		Time Collected:	11:00	AM
Comment:										
Test				L	.ab	Method		Due Date	F	Priority
% SOLIDS				S	5	% solids		9/10/2018	I	Normal (~10 Days)
%Moisture				5	6	%moisture		9/10/2018	<u>I</u>	Normal (~10 Days)
Sample #:	180828	022-002	Customer	Sample #:	0823	18CBS2 TS				
Recv'd:	🗸 Ma	trix: Soli	id	Collector:	GOR	DON CRANE	1	Date Collected:	8/23/2	2018
Quantity:	1	Date Re	eceived:	8/28/2018 1	2:46:00	PM		Time Collected:	11:00	AM
Comment:										
Test				L	.ab	Method		Due Date	F	Priority
% SOLIDS				S	3	% solids		9/10/2018		, Normal (~10 Days)
%Moisture				S	6	%moisture		9/10/2018	<u> </u>	Normal (~10 Days)
Sample #:	180828	022-003	Customer	Sample #:	082	318CBS3 TS				
Recv'd:	🗸 Ma	trix: Soli	d	Collector:	GOR	DON CRANE		Date Collected:	8/23/2	2018
Quantity:	1	Date Re	eceived:	8/28/2018 1	2:46:00	PM		Time Collected:	11:00	AM
Comment:										
Test				L	.ab	Method		Due Date	F	Priority
% SOLIDS				S	6	% solids		9/10/2018	I	Normal (~10 Days)
%Moisture				S	6	%moisture		9/10/2018	<u>_</u>	Normal (~10 Days)

Customer	Nar	ne: CITY (OF ELLEN	ISBURG			Ord	er ID:	180828022
		1401 I	E TRENT	AVE, SUIT	E 10	01	Order	Date:	8/28/2018
		SPOK	ANE		Ν	/A 99202	2		
Contact	Nar	ne: JON N	IORROW				Project Name:	STREE	T SWEEPING VS
Con	nme	nt:					(CATCH	BASIN
Sample #:	180	328022-004	Customer	Sample #:	082	318CBS4 TS			
Recv'd:	✓	Matrix: So	olid	Collector:	GC	RDON CRANE	Date Collected:	8/23/2	018
Quantity:	1	Date R	Received:	8/28/2018 12	2:46:0	00 PM	Time Collected:	11:00	AM
Comment:									
Test					ab	Method	Due Date	P	riority
% SOLIDS				5	S	% solids	9/10/2018	N	lormal (~10 Davs)
%Moisture				S	6	%moisture	9/10/2018	N	lormal (~10 Days)
Sample #:	180	328022-005	Customer	Sample #:	08	2318CBS5 CS			
Decida								0/00/0	040
Recvia:	1	Matrix: 50	Peceived:	8/28/2018 1	2.46.0		Date Collected:	11.00	018 0M
Comment:		Date N	leceiveu.	0/20/2010 1	2.40.0		Time Conected.	11.007	
••••••									
Test				L	ab	Method	Due Date	Ρ	riority
% SOLIDS				5	5	% solids	9/10/2018	<u>N</u>	lormal (~10 Days)
%Moisture				S	5	%moisture	9/10/2018	<u>N</u>	lormal (~10 Days)
Sample #:	180	328022-006	Customer	Sample #:	08	32318CBS6 CS			
Recv'd:	✓	Matrix: So	olid	Collector:	GC	ORDON CRANE	Date Collected:	8/23/20	018
Quantity:	1	Date R	Received:	8/28/2018 12	2:46:0	00 PM	Time Collected:	11:00	AM
Comment:									
Test				L	ab	Method	Due Date	Р	riority
% SOLIDS				5	5	% solids	9/10/2018	Ν	lormal (~10 Days)
%Moisture				S	3	%moisture	9/10/2018	<u>_</u>	lormal (~10 Days)
Sample #:	180	328022-007	Customer	Sample #:	0	82318CBS7 CS			
Recv'd:		Matrix: So	olid	Collector:	GC	DRDON CRANE	Date Collected:	8/23/20	018
Quantity:	1	Date R	Received:	8/28/2018 12	2:46:0	00 PM	Time Collected:	11:00	AM
Comment:									
Test				L	_ab	Method	Due Date	P	riority
% SOLIDS					2	% solids	9/10/2018	<u>^</u>	iormal (~10 Days)
701010151016				2	כ	7011UISIUIE	9/10/2018	<u>^</u>	iorinai (~10 Days <u>)</u>

Customer Name: CITY OF ELLENSBURG

Order ID:

1401 E TRENT AVE, SUITE 101 SPOKANE WA

99202

Contact Name: JON MORROW

Project Name: STREET SWEEPING VS CATCH BASIN

Order Date:

Comment:

SAMPLE CONDITION RECORD

Samples received in a cooler?	No
Samples received intact?	Yes
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Labels and chain agree?	Yes
Total number of containers?	7

180828022

8/28/2018

	Anate Lab	ek s,	1282 A	C/ Alturas Drive,	hain Moso	<i>i of</i>	<i>Cust</i> D 8384	ody 3 (20	Reco	ord -2839	FAX	882-924	46 🔾	⁷ 30828 022 CELL ^{Last} 9/10/2018 1 st SAMP 8/23/2018 1st RCVD 8/28/2018 STREET SWEEPING VS CATCH
			○ 504 E S	prague Ste D,	Spok	ane V	VA 992	202 (509) 83	38-399	9 FA	X 838-4	433 🔾	EASIN
Compa	any Name:	City	of Ellensbu	irg	Proje	ect Ma	nager:			Jor	n Mo	rrow		
Addres	ss: 140)1 E. Trei	nt Ave, Suite	101	Proje	ect Na	me & #	S	treet S	Sweep	oing	vs Catc	h Basin	 Please refer to our normal turn around times at: http://www.anateklabs.com/services/guidelines/reporting.asp
City:	Spokane	State:	WA Zip:	99202	Ema	il Addr	ess :	m	orrow	/i@ci.	ellen	sburg.v	va.us	
Phone	2	(509)	343-8515		Purc	hase (Order #:							Next Day* requests must beMail 2nd Day* Fax
Fax:		(000)			Sam	pler Na	ame & p 962	ohone:	36	G	ordo	n Crane	•	Other*
	Provid	e Sample	e Descriptio	n				List A	nalys	es Re	eque	sted		Note Special Instructions/Comments
	Sedim	ent collecte	d in filter socks		Containers	ervative: blockelume	ASTM D422							 Please send a copy of the results to Jon at email above and Aimee at aimee.navickis-brasch@hdrinc.com
Lab ID	Sample Identifica	tion Sam	pling Date/Time	Matrix	# of (Samo	PSD							SWBS
1	082318CBS1 TS	8/	23/18 11 AM	solid			×							
2	082318CBS2 TS	8/	23/18 11 AM	solid			×							
3	082318CBS3 TS	8/	23/18 11 AM	solid			×							
4	082318CBS4 TS	8/2	23/18 11 AM	solid			×							
5	082318CBS5 CS	6 8/2	23/18 11 AM	solid			×							
6	082318CBS6 CS	8/3	23/18 11 AM	solid			×							
1	082318CBS7 CS	6 8/2	23/18 11 AM	solid			x							
		_												Inspection Checklist
														Received Intact? N
														Labels & Chains Agree?
and a series														Containers Sealed? N
														VOC Head Space? Y N
														IRtaction
145,500		Printed Nar	ne	Signature	8-26	2	的法律的	C	ompan	у	1737	Date	Time	VIgnani
Relinc	quished by	Sordo	MCrane	Mordon	C	cont	9		ity of	Ellens	by	8-27-18	09:35	Temperature (°C):
Recei	ved by	Wend	407	Man	de	41	h	1	ma	top	\mathcal{I}	8/28/14) 1241	Preservative:
Relinc	uished by		100		(10	0	1				1-1910	1	
Recei	ved by		1											Date & Time: 8-28-18 1246
Relinc	quished by													Inspected By: M/a
Recei	ved by													0

Form COC01.00 - Eff 1 Mar 2015

Page 1 of 1

Samples submitted to Anatek Labs may be subcontracted to other accredited labs if necessary. This message serves as notice of this possibility. Sub-contracted analyses will be clearly noted on the analytical report.

October 2018 Data Collection Event

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	CITY OF ELLENSBURG	Batch #:	181102027
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	181102027-001 102418SSTS1 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	Date/Ti Extract	me Received ion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		84.2	%	0.1	11/8/2018 1:00:00 PM	HMD	% solids	
%moisture		15.8	%		11/8/2018 1:00:00 PM	HMD	%moisture	

	Sample Number Client Sample ID Matrix Comments
Parameter Result Units PQL Analysis Date Analyst Method G	Parameter
% solids 74.4 % 0.1 11/8/2018 1:00:00 PM HMD % solids % moisture 25.6 % 11/8/2018 1:00:00 PM HMD % moisture	% solids %moisture

Sample Number Client Sample ID Matrix Comments	181102027-003 102418SSTS3 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	B Date/T Extrac	ime Received tion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		83.9	%	0.1	11/8/2018 1:00:00 PM	HMD	% solids	
%moisture		16.1	%		11/8/2018 1:00:00 PM	HMD	%moisture	

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Client:CITY OF ELLENSBURGBatch #:181102027Address:1401 E TRENT AVE, SUITE 101
SPOKANE, WA 99202Project Name:STREET SWEEPING VS
CATCH BASINAttn:JON MORROWV

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	181102027-004 102418CBTS1 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	Date/Ti Extract	me Received ion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		56.7 43.3	% %	0.1	11/8/2018 1:00:00 PM 11/8/2018 1:00:00 PM	HMD HMD	% solids %moisture	

Sample Number Client Sample ID Matrix Comments	181102027-005 102418CBTS2 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	Date/Ti Extract	me Received ion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		62.1	%	0.1	11/8/2018 1:00:00 PM	HMD	% solids	
%moisture		37.9	%		11/8/2018 1:00:00 PM	HMD	%moisture	

Sample Number Client Sample ID Matrix Comments	181102027-006 102418CBTS3 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	Date/Ti Extract	me Received ion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		53.1	%	0.1	11/8/2018 1:00:00 PM	HMD	% solids	
%moisture		46.9	%		11/8/2018 1:00:00 PM	HMD	%moisture	

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Client:CITY OF ELLENSBURGBatch #:181102027Address:1401 E TRENT AVE, SUITE 101
SPOKANE, WA 99202Project Name:STREET SWEEPING VS
CATCH BASINAttn:JON MORROWV

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	181102027-007 102418CBCS1 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	Date/Ti Extract	me Received ion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		35.6 64.4	% %	0.1	11/8/2018 1:00:00 PM 11/8/2018 1:00:00 PM	HMD HMD	% solids %moisture	

Sample Number Client Sample ID Matrix Comments	181102027-008 102418CBCS2 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	Date/Ti Extract	me Received ion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		41.5	%	0.1	11/8/2018 1:00:00 PM	HMD	% solids	
%moisture		58.5	%		11/8/2018 1:00:00 PM	HMD	%moisture	

Sample Number Client Sample ID Matrix Comments	181102027-009 102418CBCS3 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	Date/Ti Extract	me Received tion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		51.9	%	0.1	11/8/2018 1:00:00 PM	HMD	% solids	
%moisture		48.1	%		11/8/2018 1:00:00 PM	HMD	%moisture	

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Client:CITY OF ELLENSBURGBatch #:181102027Address:1401 E TRENT AVE, SUITE 101
SPOKANE, WA 99202Project Name:STREET SWEEPING VS
CATCH BASINAttn:JON MORROWJON MORROWJON MORROWJON MORROW

Analytical Results Report

Sample Number 181102027-0 Client Sample ID 102418SSCS Matrix Solid Comments Solid			Sampling Date Sampling Time Sample Location	10/31/2018	B Date/I Extrac	11/2/2018	12:50 PM	
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		32.3	%	0.1	11/8/2018 1:00:00 PM	HMD	% solids	
%moisture		7.7	%		11/8/2018 1:00:00 PM	HMD	%moisture	

Sample Number Client Sample ID Matrix Comments	181102027-011 102418SSCS2 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	Date/Ti Extract	me Received ion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		84.5	%	0.1	11/8/2018 1:00:00 PM	HMD	% solids	
%moisture		15.5	%		11/8/2018 1:00:00 PM	HMD	%moisture	

Sample Number Client Sample ID Matrix Comments	181102027-012 102418SSCS3 Solid		Sampling Date Sampling Time Sample Location	10/31/2018	Date/T Extrac	ime Received tion Date	11/2/2018	12:50 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		91.5	%	0.1	11/8/2018 1:00:00 PM	HMD	% solids	
%moisture		8.5	%		11/8/2018 1:00:00 PM	HMD	%moisture	

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Client: CITY OF ELLENSBURG Address: 1401 E TRENT AVE, SUITE 101 SPOKANE, WA 99202 Attn: JON MORROW Batch #: Project Name:

181102027 STREET SWEEPING VS CATCH BASIN

Analytical Results Report

Authorized Signature

Kathleen a. Sattles

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated. Soil/solid results are reported on a dry-weight basis unless otherwise noted.

				061918CBSTS	061918CBSCS	061918SSTS	082318CBTS	082318CBCS	102418CBTS	102418CBCS
LABORATORY NUMBER PROJECT SAMPLE NUMBER				18-0607 180619070-008	18-0608 180619070-009	18-0609 180706055-010	18-0856 180831032 004-005-006	18-0857 180831032 007-008-009	18-1134 CBTS	18-1135 CBSC
SAMPLED BY				Client	Client	Client	Client	Client	Client	Client
SAMPLE TYPE				Bulk	Bulk	Bulk	Bulk	Bulk	Bulk	Bulk
DATE RECEIVED				7/26/18	7/26/18	7/26/18	9/14/18	9/14/18	11/27/18	11/27/18
		Units	Test Method	North	South	North	North	South	North	South
MOISTURE CONTENT		%		1.8	1.5	5.5	1.2	1.2	62.6	121.7
SIEVE ANALYSIS			ASTM D422							
	1"						100			
	3/4"					100	100-		100	
S	1/2"	%			100	99	98	100	98	100
Ι	3/8"			100	99	95	95	99	96	98
E	1/4"	Р		95	97	88	89	93	91	92
V	#10	А		86	78	56	65	67	73	70
E	#16	S		83	73	40	56	58	59	51
	#30	S		81	69	22	41	46	45	35
S	#40	Ι		80	68	16	35	39	39	29
Ι	#100	Ν		76	61	8	17	22	24	20
Z	#200	G		73	55	5.3	9.8	15	20	17
E	.05mm			72	47	5.2	7.7	12	18	15
	.01mm			46	27	2.9	2.5	4.6	12	9.0
	.005mm			22	15	2.3	1.3	3.5	10	7.8
	.001mm			5.0	2.4	1.0	1.3	1.7	4.0	3.0

SOILS LABORATORY SUMMARY

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Login Report

Customer Name:	CITY OF ELLENSBURG 1401 E TRENT AVE, SL	i IITE 101		Orde Order	er ID: 181102027 Date: 11/2/2018
Contact Name: Comment:	SPOKANE JON MORROW	WA	99202	Project Name: S C	TREET SWEEPING VS CATCH BASIN
Sample #: 1811020	027-001 Customer Sample #	t: 102418SSTS	1		
Recv'd: 🖌 Ma	trix: Solid Collecto	or: GORDON C	RANE	Date Collected:	10/31/2018
Quantity: 1	Date Received: 11/2/2018	3 12:50:00 PM		Time Collected:	
Comment:					
Test		Lab Metho	d	Due Date	Priority
% SOLIDS		S % solid	ls	11/9/2018	Normal (~10 Days)
%Moisture		S %mois	ture	11/9/2018	<u>Normal (~10 Days)</u>
Sample #: 1811020	027-002 Customer Sample #	t: 102418SSTS	32		
Recv'd: 🔽 Ma	atrix: Solid Collecto	or: GORDON C	 RANE	Date Collected:	10/31/2018
Quantity: 1	Date Received: 11/2/2018	3 12:50:00 PM		Time Collected:	
Comment:					
Test		Lab Metho	d	Due Date	Priority
% SOLIDS		S % solid	ls	11/9/2018	Normal (~10 Davs)
%Moisture		S %mois	ture	11/9/2018	<u>Normal (~10 Days)</u>
Sample #: 1811020	027-003 Customer Sample #	t: 102418SSTS	33		
Recv'd: 📈 Ma	trix: Solid Collecto	or: GORDON C	 RANE	Date Collected:	10/31/2018
Recv'd: 🖌 Ma Quantity: 1	htrix: Solid Collector Date Received: 11/2/2018	or: GORDON Cl 3 12:50:00 PM	RANE	Date Collected: Time Collected:	10/31/2018
Recv'd: ✔ Ma Quantity: 1 Comment:	htrix: Solid Collector Date Received: 11/2/2018	or: GORDON Cl 3 12:50:00 PM	RANE	Date Collected: Time Collected:	10/31/2018
Recv'd: ☑ Ma Quantity: 1 Comment:	ntrix: Solid Collector Date Received: 11/2/2018	or: GORDON Cl 3 12:50:00 PM	LLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLL	Date Collected: Time Collected:	10/31/2018
Recv'd: ע Ma Quantity: 1 Comment: Test	atrix: Solid Collector Date Received: 11/2/2018	or: GORDON Cl 3 12:50:00 PM Lab Metho	d	Date Collected: Time Collected: Due Date	10/31/2018 Priority
Recv'd: ✓ Ma Quantity: 1 Comment: <u>Test</u> % SOLIDS	atrix: Solid Collector Date Received: 11/2/2018	br: GORDON Cl 3 12:50:00 PM Lab Metho S % solic	d ds	Date Collected: Time Collected: Due Date 11/9/2018	10/31/2018 Priority <u>Normal (~10 Days)</u>

Customer	Name:	CITY C	OF ELLEN	SBURG				Ord	er ID:	: 181102027
		1401 E	TRENT	AVE, SUIT	E 10 ⁻	1		Order	Date	: 11/2/2018
		SPOKA	ANE		W	۹ و	99202			
Contact	Name:	JON M	ORROW					Project Name:		ET SWEEPING VS
Com	nment:							C	AIC	1 BASIN
Sample #:	1811020	27-004	Customer	Sample #:	1024	18CBTS1				
Recv'd:	🖌 Ma	trix: Soli	id	Collector:	GOF	RDON CRAI	NE	Date Collected:	10/31/	/2018
Quantity:	1	Date Re	eceived:	11/2/2018 12	2:50:00	D PM		Time Collected:		
Comment:										
									_	
				L	ab	Method		Due Date	P	riority
%Moisture				, S	\$	%moisture	2	11/9/2018	<u>r</u>	Normal (~10 Days)
					, 	, inteletant	, 	11/0/2010	<u> </u>	ormar (~ 10 Days)
Sample #:	1811020	27-005	Customer	Sample #:	1024	18CBTS2				
Recv'd:	🖌 Ma	trix: Soli	d	Collector:	GOF	RDON CRAI	NE	Date Collected:	10/31/	/2018
Quantity:	1	Date Re	eceived:	11/2/2018 12	2:50:00	D PM		Time Collected:		
Comment:										
Test				L	ab	Method		Due Date	Р	Priority
% SOLIDS				S	3	% solids		11/9/2018		Normal (~10 Days)
%Moisture				S	6	%moisture	Э	11/9/2018	<u> </u>	Normal (~10 Days)
Sample #:	1811020	27-006	Customer	Sample #:	102	418CBTS3				
				• • •]			100.00
Recv'd:		Dete De	D	Collector:	GOF		NE	Date Collected:	10/31/	/2018
Quantity:	1	Date Re	eceivea:	11/2/2018 12	2:50:00	J PIVI		Time Collected:		
comment.										
Test				L	.ab	Method		Due Date	P	Priority
% SOLIDS				S	6	% solids		11/9/2018	<u>/</u>	Normal (~10 Days)
%Moisture				S	6	%moisture	9	11/9/2018	<u>/</u>	Normal (~10 Days)
Sample #:	1811020	27-007	Customer	Sample #:	102	418CBCS1				
Recv'd:	🗸 Ma	t rix: Soli	d	Collector:	GOF	RDON CRAI	⊐ NE	Date Collected:	10/31/	/2018
Quantity:	1	Date Re	eceived:	11/2/2018 12	2:50:00	D PM		Time Collected:		
Comment:										
Test				L	.ab	Method		Due Date	P	Priority
% SOLIDS				5	5	% solids		11/9/2018	<u>^</u>	Normal (~10 Days)
%Moisture				S)	%moisture	9	11/9/2018	<u>/</u>	vormal (~10 Days)

Customer Name: CITY OF ELLENSBURG Order ID: 181102027 1401 E TRENT AVE, SUITE 101 Order Date: 11/2/2018 SPOKANE 99202 WA Project Name: STREET SWEEPING VS CATCH BASIN Contact Name: JON MORROW Comment: Sample #: 181102027-008 Customer Sample #: 102418CBCS2 Recv'd: Matrix: Solid Collector: GORDON CRANE Date Collected: 10/31/2018 \checkmark 11/2/2018 12:50:00 PM **Time Collected:** Quantity: 1 Date Received: Comment: Test Method Due Date Lab Priority % SOLIDS S % solids 11/9/2018 Normal (~10 Days) S %Moisture %moisture 11/9/2018 Normal (~10 Days) 181102027-009 Sample #: Customer Sample #: 102418CBCS3 Recv'd: Matrix: Solid Collector: GORDON CRANE **Date Collected:** 10/31/2018 \checkmark Quantity: 1 Date Received: 11/2/2018 12:50:00 PM **Time Collected:** Comment: Method Due Date Priority Test Lab % SOLIDS S % solids 11/9/2018 Normal (~10 Days) S %moisture %Moisture 11/9/2018 Normal (~10 Days) Sample #: Customer Sample #: 181102027-010 102418SSCS1 10/31/2018 Recv'd: Collector: GORDON CRANE Date Collected: \checkmark Matrix: Solid 11/2/2018 12:50:00 PM Quantity: 1 Date Received: **Time Collected:** Comment: Method Priority Test Lab Due Date % SOLIDS S 11/9/2018 % solids Normal (~10 Days) %Moisture S %moisture 11/9/2018 Normal (~10 Days) Sample #: 181102027-011 Customer Sample #: 102418SSCS2 Recv'd: Matrix: Solid Collector: GORDON CRANE **Date Collected:** 10/31/2018 \checkmark Quantity: Date Received: 11/2/2018 12:50:00 PM **Time Collected:** 1 Comment: Test Lab Method **Due Date** Priority % SOLIDS s % solids 11/9/2018 Normal (~10 Days) %Moisture S 11/9/2018 %moisture Normal (~10 Days)

Customer Name: CITY OF ELLENSBURG

Contact Name: JON MORROW

Labels and chain agree?

Total number of containers?

SPOKANE

11/2/2018

1401 E TRENT AVE, SUITE 101

99202

WA

Project Name: STREET SWEEPING VS CATCH BASIN

Order Date:

Yes

12

Comment:

Sample #: 181102027-012 Customer Sample #: 102418SSCS3 Collector: GORDON CRANE Date Collected: Recv'd: \checkmark Matrix: Solid 10/31/2018 11/2/2018 12:50:00 PM **Time Collected:** Quantity: 1 Date Received: Comment: Test Lab Method Due Date Priority % SOLIDS S % solids 11/9/2018 Normal (~10 Days) s %Moisture %moisture 11/9/2018 Normal (~10 Days) SAMPLE CONDITION RECORD Samples received in a cooler? Yes Samples received intact? Yes What is the temperature of the sample(s)? (°C) 2.7/2.8 Samples received with a COC? Yes Samples received within holding time? Yes Are all sample bottles properly preserved? Yes

	Anatek Labs, Inc	• 1282 A	Cl Ituras Drive,	hain Mose	of (Cust 8384	ody	Re 208) 8	cor 83-2	d 839 FAX) (882-	9246	0	81102 027 CELL Last 11/9/2018 Due 10/31/201 1st RCVD 11/2/2018 STREET SWEEPING VS CATCH E ASIN
Company	Name:	504 E Sp	rague Ste D,	Spoka Proje	ne W ct Man	A 99 ager:	202	(509)	838	-3999 FA	AA 83	8-443	3	Turn Around Time & Reporting
Compan	ly Name.	City of Ellensbur	g	Proje	ct Nan	ne 8 f	¥ -			3011 1410				Please refer to our normal turn around times at:
Address	1401 E	E. Trent Ave, Suite	101	rioje	or Hall	ie a i		Stree	et Sv	veeping	vs Ca	atch	Basin	http://www.anateklabs.com/services/guidelines/reporting.asp
City:	Spokane	State: WA Zip:	99202	Emai	Addre	988 :	1	morr	owj(@ci.eller	nsbur	g.wa	.us	Normal *All rush order Phone Next Day* requests must be Mail
Phone:		(509) 343-8515		Purch	nase O	rder #								2nd Day* prior approved. Fax
Fax:		· · ·		Sam	pler Na	ame &	phon	e: (Gord	Ion Cran	e 509	962-	7236	Other*
	Provide	Sample Description	La man	1		S. S.	List	Ana	lyse	s Reque	sted			Note Special Instructions/Comments
	Catch bas	sin and street sediment		Containers	nple Volume	sture Content STMD2216	3 ASTM D422	Janks Content STM D2974	1					Please send a copy of the results to Jon at email above and Aimee at aimee.navickis-brasch@hdrinc.com
Lab	Sample Identification	n Sampling Date/Time	Matrix	jo #	San	Mol	PSC	A O						
1	102418SSTS1	10/31/2018	solid			×								For ASTM D422 testing, combine all 082218CBTS
2	102418SSTS2	10/31/2018	solid			x			1		_			samples, then combine all 082218CBCS samples and use
3	102418SSTS3	10/31/2018	solid			×								the following sieve sizes:
ú	102418CBTS1	10/31/2018	solid			×	×		1					>2mm, 0.25-2mm, 0.075-0.25mm, <0,075 mm
5	102418CBTS2	10/31/2018	solid			×								
10	102418CBTS3	10/31/2018	solid			×			-					
1	102418CBCS1	10/31/2018	solid			×	×	-						
8	102418CBCS2	10/31/2018	solid			×								Inspection Checklist
9	102418CBCS3	10/31/2018	solid			×								Received Intact? (Y) N
10	102418SSCS1	10/31/2018	solid			×								Labels & Chains Agree? N
FL	102418SSCS2	10/31/2018	solid			×								Containers Sealed? (2) N
17	102418SSCS3	10/31/2018	solid		-	×					_			VOC Head Space?
											The support of the			$\frac{1}{5/c/r}$
	Pr	inted Name	Signature	-6		all all a		Com	pany		Date		Time	andas int
Relinc	nuished by	Fordon Crave	Mordon	P	m	La		Cit	of	Flenst	× M-	1-18	12-00AN	Temperature (°C): 0.1/2.8 1/21
Recei	ived by	Wendy 07	Men	du	1h			a	nn	tele	-11-	7-12	\$50	Preservative:
Reline	guished by			0	0)								0
Rece	ived by								_					Date & Time: 11-2-10 1440
Relin	quished by													Inspected By: Wink
Rece	ived by	- 10.790 14							1					0

Page 1 of 1

Form COC01 00 - Eff 1 Mar 2015 Samples submitted to Anatek Labs may be subcontracted to other accredited labs if necessary. This message serves as notice of this possibility. Sub-contracted analyses will be clearly noted on the analytical report.

•
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Client:	CITY OF ELLENSBURG	Batch #:	181026039
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	181026039-001 102418CBS1 TS Solid		Sampling Date Sampling Time Sample Location	10/24/2018 3:00 PM	B Date/Ti Extract	me Received ion Date	10/26/2018	11:30 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		11.1	%	0.1	11/14/2018 12:00:00 PM	HMD	% solids	
%moisture		88.9	%		11/14/2018 12:00:00 PM	HMD	%moisture	

Sample Number Client Sample ID Matrix Comments	181026039-002 102418CBS2 TS Solid]	Sampling Date Sampling Time Sample Location	10/24/2018 3:00 PM	B Date/Tii Extracti	ne Received ion Date	10/26/2018	11:30 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		23.5 76.5	% %	0.1	11/14/2018 12:00:00 PM 11/14/2018 12:00:00 PM	HMD HMD	% solids %moisture	

Sample Number Client Sample ID Matrix Comments	181026039-003 102418CBS3 TS Solid		Sampling Date Sampling Time Sample Locatior	10/24/201 3:00 PM	8 Date/T Extrac	me Received ion Date	10/26/2018	11:30 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		18.1	%	0.1	11/14/2018 12:00:00 PM	I HMD	% solids	
%moisture		81.9	%		11/14/2018 12:00:00 PM	I HMD	%moisture	

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Client:CITY OF ELLENSBURGBatch #:181026039Address:1401 E TRENT AVE, SUITE 101
SPOKANE, WA 99202Project Name:STREET SWEEPING VS
CATCH BASINAttn:JON MORROWVV

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	181026039-004 102418CBS4 TS Solid]	Sampling Date Sampling Time Sample Location	10/24/2018 3:00 PM	8 Date/Ti Extract	me Received ion Date	10/26/2018	11:30 AM
Parameter % solids %moisture		Result 19.1 80.9	Units % %	PQL 0.1	Analysis Date 11/14/2018 12:00:00 PM 11/14/2018 12:00:00 PM	Analyst HMD HMD	Method % solids %moisture	Qualifier

Sample Number Client Sample ID Matrix Comments	181026039-005 102418CBS5 TS Solid]	Sampling Date Sampling Time Sample Location	10/24/201 3:00 PM	8 Date/Ti Extract	me Received ion Date	10/26/2018	11:30 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		6.1	%	0.1	11/14/2018 12:00:00 PM	HMD	% solids	
%moisture		93.9	%		11/14/2018 12:00:00 PM	HMD	%moisture	

Sample Number Client Sample ID Matrix	181026039-006 102418CBS6 TS Solid]	Sampling Date Sampling Time Sample Locatior	10/24/201 3:00 PM	8 Date/Tii Extracti	ne Received on Date	10/26/2018	11:30 AM
Comments Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		4.2 95.8	% %	0.1	11/14/2018 12:00:00 PM 11/14/2018 12:00:00 PM	HMD HMD	% solids %moisture	

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181026039

CATCH BASIN

STREET SWEEPING VS

Client:CITY OF ELLENSBURGBatch #:Address:1401 E TRENT AVE, SUITE 101Project Name:SPOKANE, WA 99202SPOKANE, WA 99202Attn:JON MORROW

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	181026039-007 102418CBS7 TS Solid]	Sampling Date Sampling Time Sample Location	10/24/2018 3:00 PM	3 Date/T Extrac	me Received tion Date	10/26/2018	11:30 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		7.7	%	0.1	11/14/2018 12:00:00 PM	I HMD	% solids	
%moisture		92.3	%		11/14/2018 12:00:00 PM	I HMD	%moisture	

Authorized Signature

athlen ()

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

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Sample Extraction Logbook

%Moisture instructions: Determine the percent moisture for each solid sample by oven drying about 10.0g of sample at 105°C for 2 hours. Allow to cool in a dessicator and re-weigh. Oven dry for an additional 30 minutes and re-weigh. Further drying is necessary if the two weighings differ by more than 1%.

-

				(4			, no	migo dillo by I	nore man 1%.	
Lab Sample ID		t Dish +	Dry 1	Dry 2	%					
102418CBS1 TS AN		wer (g)	(6)	(g)	moisture	Sample Weight	(g) Methoc	Balance	Date/Time	Initiale
	280	070	300	000	0.08		2 min	-+	11 11 16 1000	11111013
102418CB52 15 -(1)2	284	88	30	HIN	76.5		101 101		MA 8-1-1	HIND
102418CBS3 TS -003	280	1000	din	200	010					-
102418CBS4 TS -004	tyc	951	HIO	2100	ava-					-
102418CBS5 TS - ME	00C	ULL VILL	VUC	Sic	1.000					
102418CBS6 TS		210	Nav	200	22		anto an			
	1078	ICh	310	210	95.8					
102 CI /CAURINE	380	1330	ale	340	8.3					-
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Comments:										7

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L001.00 - Eff 22 Aug 2016

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Login Report

Customer Name: CITY OF ELLE 1401 E TRENT SPOKANE	NSBURG AVE, SUITE 101 WA 9920	Order ID: Order Date: 2	181026039 10/26/2018
Contact Name: JON MORROV Comment:	V	Project Name: STREET S CATCH B	SWEEPING VS ASIN
Sample #: 181026039-001 Custom Recv'd: Matrix: Solid Quantity: 1 Date Received: Comment:	er Sample #: 102418CBS1 TS Collector: GORDON CRANE 10/26/2018 11:30:00 AM	Date Collected:10/24/201Time Collected:3:00 PM	8
Test	Lab Method	Due Date Prior	ity
% SOLIDS	S % solids	11/2/2018 <u>Nor</u>	mal (~10 Days <u>)</u>
%Moisture	S %moisture	11/2/2018 <u>Nor</u>	<u>mal (~10 Days)</u>
Sample #: 181026039-002 Custom Recv'd: Matrix: Solid Quantity: 1 Date Received: Comment:	er Sample #: 102418CBS2 TS Collector: GORDON CRANE 10/26/2018 11:30:00 AM	Date Collected:10/24/201Time Collected:3:00 PM	8
Test	Lab Method	Due Date Prior	ity
% SOLIDS	S % solids	11/2/2018 <u>Nor</u>	mal (~10 Days)
%Moisture	S %moisture	11/2/2018 <u>Nor</u>	mal (~10 Days)
Sample #: 181026039-003 Custom Recv'd: ✓ Matrix: Solid Quantity: 1 Date Received: Comment: Comment:	er Sample #: 102418CBS3 TS Collector: GORDON CRANE 10/26/2018 11:30:00 AM	Date Collected:10/24/201Time Collected:3:00 PM	8
Test	Lab Method	Due Date Prior	ity
% SOLIDS	S % solids	11/2/2018 <u>Nor</u>	mal (~10 Days)
%Moisture	S %moisture	11/2/2018 Nor	mal (~10 Days)

Customer Name:	CITY OF ELLENSBURG	G		Order I	D: 181026039
	1401 E TRENT AVE, SI	JITE 10 ⁻	1	Order Dat	te: 10/26/2018
	SPOKANE	W	A 99202		
Contact Name	JON MORROW			Project Name: STR	EET SWEEPING VS
Comment:				CAT	CH BASIN
Sample #: 181026	039-004 Customer Sample	#: 1024	18CBS4 TS		
Recv'd: 🔽 Ma	atrix: Solid Collect	or: GOF	RDON CRANE	Date Collected: 10/2	24/2018
Quantity: 1	Date Received: 10/26/20	18 11:30:0	00 AM	Time Collected: 3:00	0 PM
Comment:					
Test		Lah	Method	Due Date	Priority
% SOLIDS		S	% solids	11/2/2018	Normal (~10 Days)
%Moisture		S	%moisture	11/2/2018	Normal (~10 Days)
Sample # 181026	039-005 Customer Sample	#· 1024	418CBS5 TS		
Recv'd: <u>v</u> Ma	atrix: Solid Collect	or: GO		Date Collected: 10/2	24/2018 0 DM
Quantity:	Date Received: 10/26/20	16 11:30:0		Time Collected: 3.00	
comment.					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	11/2/2018	<u>Normal (~10 Days)</u>
%Moisture		S	%moisture	11/2/2018	<u>Normal (~10 Days)</u>
Sample #: 181026	039-006 Customer Sample	#: 1024	418CBS6 TS		
Recv'd: 🖌 Ma	atrix: Solid Collect	or: GOF	RDON CRANE	Date Collected: 10/2	24/2018
Quantity: 1	Date Received: 10/26/20	18 11:30:0	00 AM	Time Collected: 3:00	0 PM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	11/2/2018	Normal (~10 Davs)
%Moisture		S	%moisture	11/2/2018	Normal (~10 Days)
Sample #: 181026	039-007 Customer Sample	#: 1024	418CBS7 TS		
Recv'd: 🔽 Ma	atrix: Solid Collect	or: GOF	RDON CRANE	Date Collected: 10/2	24/2018
Quantity: 1	Date Received: 10/26/20)18 11:30:(00 AM	Time Collected: 3:00	0 PM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	11/2/2018	<u>Normal (~10 Days)</u>
%IVIOISTUI ^r e		3	‰moisture	11/2/2018	<u>Normai (~10 Days)</u>

Customer Name: CITY OF ELLENSBURG

Order ID: 181026039

Order Date: 10/26/2018

SPOKANE WA

1401 E TRENT AVE, SUITE 101

99202

Contact Name: JON MORROW

Comment:

Project Name: STREET SWEEPING VS CATCH BASIN

SAMPLE CONDITION RECORD

Samples received in a cooler?	No
Samples received intact?	Yes
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Labels and chain agree?	Yes
Total number of containers?	7

														31026 039 CELL Last 11/2/2018
	Anatek		C	hain	of	Cusi	tody	Rec	cord					A 1 st SAMP 10/24/201 1st RCVD 10/26/2018
	Labs,	1282 A	lturas Drive.	Mose	ow IE	8384	43 (2	208) 88	83-283	9 FAX	882-9	246	0	LS TREET SWEEPING VS CATCH
	Inc.	◯ 504 E Sp	orague Ste D,	Spok	ane W	A 99	202	(509)	838-39	99 FA	X 838	-4433	3 🔾	EASIN
Compa	ny Name:	City of Ellensbur	g	Proje	ect Mar	ager:			Jo	on Mor	row			
Addres	^{ss:} 1401 E	. Trent Ave. Suite	101	Project Name & #: Street Sweeping vs Catch Basin								http://www.anateklabs.com/services/guidelines/reporting.asp		
City:	Spokane	State: WA Zip:	99202	Email Address : morrowi@ci.ellensburg.wa.us								Normal *All rush orderPhone		
Phone	Эрокане		33202	Purchase Order #:								Next Day* requests must beMail		
FIIUTIE		(509) 343-8515										Other*		
Fax:				Sam	pler Na	ime &	phon	e:	(Gordo	n Cra	ne		
	Provide S	ample Description	1	and the	25		List	Anal	yses F	Reque	sted		a state of the	Note Special Instructions/Comments
	Sediment of	collected in filter socks		Prese	ervative:		1				+			Please send a copy of the results to
				iner	une	0422	1							Jon at email above and Aimee at
				ontai	Brekke	TM	1							aimee.navickis-brasch@hdrinc.com
Lab			1	d C	Idime	SD AS	1							
ID	Sample Identification	Sampling Date/Time	Matrix	#	ŝ	ă.		+		_				
	102418CBS1 TS	10/24/2018 3PM	solid	_		×		+		_				
	102418CBS2 TS	10/24/2018 3PM	solid	_	<u> </u>	×		+				-+		
and the second	102418CBS3 TS	10/24/2018 3PM	solid	_		×		+						
	102418CBS4 TS	10/24/2018 3PM	solid	_		×	<u> </u>	+						
Sales and	102418CBS5 CS	10/24/2018 3PM	solid	_		×					\vdash	-+		
	102418CBS6 CS	10/24/2018 3PM	solid	_		×		+						
and the second	102418CBS7 CS	10/24/2018 3PM	solid	_		×		+						Inspection Checklist
				_			-					_		Inspection Checklist
				_		<u> </u>	L				+	_		Received Intact?
				_			-				+ +			Labels & Chains Agree?
				_							+			Containers Sealed? (Y) N
				_			-				+			VOC Head Space? Y N
WERE R			~	ole please	1-11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	1	Nigo Janes			1	Dete	107-00-	L	NC UPS BOX
	Prin	ted Name	Signature					Comp	bany		Date	Sec. (Arris	Ime	1 to- love -
Relin	quished by			9										Temperature (°C):
Rece	Received by Kathy Sattler Kathy			attle	1			And	atek	labs	10-26	18	130	Preservative:
Relin	Relinquished by													
Reas														Date & Time: 10-26-18 1130
Rece								+						Inspected By: KAS
Relin	quished by											-+		Inspecieu by. 190
Rece	ived by													

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Page 1 of 1

Samples submitted to Anatek Labs may be subcontracted to other accredited labs if necessary. This message serves as notice of this possibility. Sub-contracted analyses will be clearly noted on the analytical report.

	Anatek		<u> </u>	hain	of	Cus	tod	v Re	cor	d		ſ			⁻ 81026 039 CELL Last 11/2/2018 1 st SAMP 10/24/201 1st RCVD 10/26/2018 AS TREET SWEEPING VS CATCH
	Labs, Inc.	0 1282 A 0 504 E S	lturas Drive, prague Ste D,	Mosc Spok	ow II ane W) 838 /A 99	43 (208) 8 (509)	83-2 838	2839 I -3999	FAX FAX	882- X 83	9246 8-443	33 0	
Compa	iny Name:	City of Ellensbu	ra	Proje	ect Mar	nager:				Jon	Mor	row			Turn Around Time & Reporting
Addres	s: 1401	E Trent Ave Suite	101	Project Name & #: Street Sweeping vs Catch Basin									Please refer to our normal turn around times at. bttp://www.anateklabs.com/services/quidelines/reporting.asp.		
City:	Crakers	State: Zip:		Email Address									Normal *All such and Phone		
	Spokane	WA	99202		morrowj@ci.eliensburg.wa.us					liens	sbur	Next Day* requests must beMail			
Phone		(509) 343-8515		Purc	Purchase Order #:							2nd Day* prior approvedFax			
Fax:	ax:				pler Na	ame &	phor	ie:		Go	rdor	n Cra	ane		
	Provide Sample Description						List	t Ana	lyse	s Rec	ques	ted			Note Special Instructions/Comments
	Sediment	collected in filter socks		Drace	evative T										Please send a copy of the results to
				Containers	ole Volum	r Weight	VSTM 0422								Jon at email above and Aimee at aimee.navickis-brasch@hdrinc.com
Lab	Sample Identification	n Sampling Date/Time	Matrix	4 0,0	Samp	ę	1982								
	102418CBS1 TS	10/24/2018 3PM	solid			×									
E MARRAN	102418CBS2 TS	10/24/2018 3PM	solid			×			(
	102418CBS3 TS	10/24/2018 3PM	solid			×									
	102418CBS4 TS	10/24/2018 3PM	solid			×									
	102418CBS5 CS	10/24/2018 3PM	solid			×									
	102418CBS6 CS	10/24/2018 3PM	solid			×									
	102418CBS7 CS	10/24/2018 3PM	solid			×									
				_											Inspection Checklist
															Received Intact? Y N
				-						+ +					Labels & Chains Agree? Y N
				-		<u> </u>	Į								Containers Sealed? V N
		_		-						$\left \right $					VOC Head Space? Y IN
17 19 19 19 19 19 19 19 19 19 19 19 19 19	Drie	stad Nama	Signatura	1.000.000	0	10111111	anan	Com	nany	all she had	and de	Date	1.897.972	Time	NC UPS BOX
Paling	lished by		Signature	1.1	0	a kur yanga		CL	A	Fh	m.	10-2	5-18	4.74	Competature (°C.)
Denti	ad har V	Thu Sattler	THU I	Ha	M	m		Ann	11	dela		10-21	18	1120	Presentative
Receiv	ed by	any sanu	have s	DUIR				1110	Jack	Jul	Y	10 21	010	11.50	Preservative.
Kelingu	lished by		~					+							Date & Time 10-21, 10 1120
Receiv	ed by														Date & Time. 10 2018 [11.50
Relinqu	uished by														Inspected By: NO
Receiv	ed by														

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Samples submitted to Anatek Labs may be subcontracted to other accredited labs if necessary. This message serves as notice of this possibility. Sub-contracted analyses will be clearly noted on the analytical report.

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Client: CITY OF ELLENSBURG Address: 1401 E TRENT AVE, SUITE 101 SPOKANE, WA 99202 Attn: JON MORROW

Batch #:181129037Project Name:SWEEPINGS PILE TEST

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	181129037-001 SWEEP PILE #1 Soil	Sam Sam Sam	pling Date pling Time ple Locatio	11/27/2018 2:50 AM 1	E	Date/Time Received 11/29/20112:49 PM Extraction Date			
Parameter		Result	Units	PQL A	nalysis Date	Analyst	Method	Qualifier	
Arsenic		5.29	mg/Kg	0.823 11/29	/2018 5:38:00 F	M BAG	EPA 6020A		
Barium		152	mg/Kg	0.823 11/29	/2018 5:38:00 F	M BAG	EPA 6020A		
Cadmium		0.918	mg/Kg	0.823 11/29	/2018 5:38:00 F	M BAG	EPA 6020A		
Chromium		51.5	mg/Kg	0.823 11/29	/2018 5:38:00 F	M BAG	EPA 6020A		
Lead		94.9	mg/Kg	0.823 11/29	/2018 5:38:00 F	M BAG	EPA 6020A		
Mercury-ICPM	S	0.125	mg/Kg	0.0823 11/29	/2018 5:38:00 F	M BAG	EPA 6020A		
Selenium		3.02	mg/Kg	0.823 11/29	/2018 5:38:00 F	M BAG	EPA 6020A		
Silver		ND	mg/Kg	0.823 11/29	/2018 5:38:00 F	M BAG	EPA 6020A		
Diesel		ND	mg/kg	250 11/30	/2018 9:44:00 A	M LMD	NWTPHDX		
Lube Oil		2360	mg/kg	1000 11/30	/2018 9:44:00 A	M LMD	NWTPHDX		
%moisture		39.1	Percent	11/29	/2018 1:15:00 F	M BAG	%moisture		
			Surrog	jate Data					
Sample Number	181129037-001								
Surrogate St hexacosane	tandard		Metho NWTPI	d HDX	Percen	t Recovery 12.4	Cont	t rol Limits 50-150	
Authorized Signature	Kathleen A.	Hun () _ () Sattler, Lab Mar	atter adder						

ND Not Detected

PQL Practical Quantitation Limit

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Login Report

Customer Name:	CITY OF ELLENSBURG			Order ID:	181129037			
	1401 E TRENT AVE, SU	ITE 101		Order Date:	11/29/2018			
	SPOKANE	WA	99202					
Contact Name:	JON MORROW			Project Name: SWEEPINGS PILE TEST				
Comment:								
Sample #: 1811290	037-001 Customer Sample #	EP PILE #1						
Recv'd: 🖌 Ma	trix: Soil Collecto	r: GOR	DON CRANE	Date Collected: 11/27/2	2018			
Quantity: 1	Date Received: 11/29/201	8 12:49:0	0 PM	Time Collected: 2:50 AM	Л			
Comment:								
Tost		Lab	Mathad	Duo Dato Br	iority			
%Moisture		S	%moisture	11/30/2018 1				
		\$		11/30/2018 <u>1</u>	Day Day			
Arsenic		S		11/30/2018 <u>1</u>	<u>Day</u> Day			
Barium		s	EPA 6020A	11/30/2018 1	<u>Day</u> Dav			
Cadmium		s	EPA 6020A	11/30/2018 1	<u>Day</u> Dav			
Chromium		s	EPA 6020A	11/30/2018 1	Day Dav			
Lead		S	EPA 6020A	11/30/2018 1	Day Dav			
Mercury-ICPMS		S	EPA 6020A	11/30/2018 1	<u>Day</u> Dav			
Selenium		S	EPA 6020A	11/30/2018 1	 Dav			
Silver		S	EPA 6020A	11/30/2018 1	 Dav			
TOTAL 8		S	N/A	11/30/2018 1	 Dav			
				-				

Customer Name: CITY OF ELLENSBURG

Order ID:

1401 E TRENT AVE, SUITE 101 SPOKANE WA

99202

Contact Name: JON MORROW

Project Name: SWEEPINGS PILE TEST

Order Date:

Comment:

SAMPLE CONDITION RECORD

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature of the sample(s)? (°C)	4.6
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Labels and chain agree?	Yes
Total number of containers?	1

181129037

11/29/2018

	Anatel	k	C	hain	of (Cusi	tody	Rec	ord					B1129 037 CELL Last 11/30/2018 1st SAMP 11/27/201 1st RCVD 11/29/2040
	Labs Inc.	, 1282 A 504 E Sj	Alturas Drive, prague Ste D,	Mosc Spoka	ow ID ane W	9 838 A 99	43 (2 202	208) 88 (509) 8	33-283 838-39	9 FAX 99 FA	K 882- X 838	9246 8-443	30	SWEEPINGS PILE TEST
Comp	any Name:	City of Ellensbu	rg	Proje	ct Mar	ager:		1	Jo	on Mo	rrow			
Addre	SS:	501 N Anderson St.	and the second se	Proje	ct Nan	ne & i	#:	1	sweepings pile test					Please refer to our normal turn around times at: http://www.anateklabs.com/services/guidelines/reporting.asp
City:	Ellensburg	State: WA Zip:	99892	Email Address : morrowj@ci.ellensburg.wa.us							Normal *All rush orderPhone			
Phone	:	(509) 929-3844		Purchase Order #:							Next Day* requests must beMail 2nd Day* prior approvedFax			
Fax:				Sampler Name & phone: Gordon Crane 509 962-7236						Cran	Other*			
10	Provide	Sample Description	n				List	Analy	/ses F	Reque	sted			Note Special Instructions/Comments
	Catch b	basin and street sediment	T	Containers	ble Volumera	трн	metals	1						 Please send a copy of the results to Jon at email above and Aimee at aimee.navickis-brasch@hdrinc.com
Lab ID	Sample Identificati	ion Sampling Date/Time	Matrix	# of (Sam									
	sweep pile #1	11-27-18 250 AM	solid	1		×	×							sample for TPH and metals, per email from Jon Morrow
2013														just DX for the TPH
1										_				<u> </u>
				+			<u> </u>							
							-							
States 1				+										
C.F. Law				+		-	-	1						Inspection Checklist
														Received Intact? (Y) N
171000														Labels & Chains Agree? N N
- the														Containers Sealed? N N
														VOC Head Space?
	- 468 () or of the part of the second se					No. of Content			Manders N. Lord	Days "Children Land" IT	D	A STORES	-	Inelali
	P	rinted Name	Signature	12				Compa	any		Date	7.14	Time	- HI d'ant
Reling	uished by	rordon Crane	torla	C	are			City	ofE	burg	11-28	3-18	10:20	$\frac{1}{2} = \frac{1}{2} $
Receiv	ved by	NENCH OF.	M.a.	dy	In	$\left(\right)$		an	all	T/	11-	79-1B	1240	Preservative:
Relinq	uished by)		0	° ()								
Receiv	ved by	v												Date & Time: 11-29-16 1249
Relinq	uished by													Inspected By: M/07
Receiv	ved by													

Form COC01.00 - Eff 1 Mar 2015

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Samples submitted to Anatek Labs may be subcontracted to other accredited labs if necessary. This message serves as notice of this possibility. Sub-contracted analyses will be clearly noted on the analytical report.

April 2019 Data Collection Event

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Client:	CITY OF ELLENSBURG	Batch #:	190508045
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix	Sample Number 190508045-001 Client Sample ID 042519SSTS1 Matrix Solid Comments Solid		Sampling Date Sampling Time Sample Locatior	5/2/2019 9:20 AM 1	Date/ Extra	5/8/2019	1:15 PM	
Comments								
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		86.2	%	0.1	5/9/2019	NDE	% solids	
%moisture		13.8	Percent		5/9/2019	NDE	%moisture	

Sample Number Client Sample ID Matrix	190508045-002 042519SSTS2 Solid		Sampling Date Sampling Time Sample Locatior	5/2/2019 9:20 AM 1	Date/ Extra	Date/Time Received Extraction Date		
Comments Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		84.3 15.7	% Percent	0.1	5/9/2019 5/9/2019	NDE NDE	% solids %moisture	

Sample Number Client Sample ID Matrix Comments	190508045-003 042519SSTS3 Solid		Sampling Date Sampling Time Sample Location	5/2/2019 9:20 AM n	Date/ Extra	5/8/2019	1:15 PM	
Parameter % solids		Result	Units %	PQL	Analysis Date	Analyst	Method	Qualifier
%moisture		17.1	Percent	0.1	5/9/2019	NDE	%moisture	

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Client:	CITY OF ELLENSBURG	Batch #:	190508045
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	190508045-004 042519CBTS1 Solid		Sampling Date Sampling Time Sample Locatior	5/2/2019 9:15 AM 1	Date/ Extra	Time Received ction Date	5/8/2019	1:15 PM
Parameter % solids %moisture		Result 54.4 45.6	Units % Percent	PQL 0.1	Analysis Date 5/9/2019 5/9/2019	Analyst NDE NDE	Method % solids %moisture	Qualifier

Sample Number Client Sample ID Matrix Comments	190508045-005 042519CBTS2 Solid		Sampling Date Sampling Time Sample Locatior	5/2/2019 9:15 AM	Date/ Extra	Time Received ction Date	5/8/2019	1:15 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		56.3 43.7	% Percent	0.1	5/9/2019 5/9/2019	NDE NDE	% solids %moisture	

Sample Number Client Sample ID Matrix	190508045-006 042519CBTS3 Solid		Sampling Date Sampling Time Sample Locatior	5/2/2019 9:15 AM 1	Date/ Extra	Time Received ction Date	5/8/2019	1:15 PM
Comments Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		63.8 36.2	% Percent	0.1	5/9/2019 5/9/2019	NDE NDE	% solids %moisture	

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Client:	CITY OF ELLENSBURG	Batch #:	190508045
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	190508045-007 COMPOSITE: CBTS1, 2, 3 Solid	Sampling Date Sampling Time Sample Locatior	5/2/2019 1	Date/Tii Extracti	ne Received ion Date	5/8/2019	1:15 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS	10.3	%	0.01	5/10/2019 12:00:00 PM	NDE	SM2540E	
%moisture	40	Percent		5/9/2019	NDE	%moisture	

Sample Number Client Sample ID Matrix Comments	190508045-008 042519CBCS1 Solid		Sampling Date Sampling Time Sample Locatior	5/2/2019 9:15 AM 1	Date/ Extra	Time Received ction Date	5/8/2019	1:15 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		57.5	%	0.1	5/9/2019	NDE	% solids	
%moisture		42.5	Percent		5/9/2019	NDE	%moisture	

Sample Number Client Sample ID Matrix Comments	190508045-009 042519CBCS2 Solid		Sampling Date Sampling Time Sample Locatior	5/2/2019 9:15 AM 1	Date/ Extra	Time Received ction Date	5/8/2019	1:15 PM
Parameter % solids %moisture		Result 70.7 29.3	Units % Percent	PQL 0.1	Analysis Date 5/9/2019 5/9/2019	Analyst NDE NDE	Method % solids %moisture	Qualifier

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Client:	CITY OF ELLENSBURG	Batch #:	190508045
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Comments]	Sample Location	1 1	Extra	ction Date		
Parameter % solids	Result	Units %	PQL 0.1	Analysis Date 5/9/2019	Analyst NDE	Method % solids	Qualifier

Sample Number Client Sample ID Matrix Comments	190508045-011 COMPOSITE: CBCS1, 2, 3 Solid	Sampling Date Sampling Time Sample Location	5/2/2019	Date/Tii Extract	me Received ion Date	5/8/2019	1:15 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS	13.5	%	0.01	5/10/2019 12:00:00 PM	NDE	SM2540E	
%moisture	34.2	Percent		5/9/2019	NDE	%moisture	

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Client: CITY OF ELLENSBURG Address: 1401 E TRENT AVE, SUITE 101 SPOKANE, WA 99202 Attn: JON MORROW Batch #: Project Name: 190508045 STREET SWEEPING VS CATCH BASIN

Analytical Results Report

Authorized Signature

Kathleen a. Sattles

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated. Soil/solid results are reported on a dry-weight basis unless otherwise noted.



Proudly serving the Inland Northwest since 1976

May 30, 2019

Kathy Sattler Anatek Labs, Inc 504 E Sprague Ave Ste D Spokane, WA 99202

Project Number L19089

PROJECT: Anatek 2019 Materials

SUBJECT: Results of Laboratory Testing Report #2

At your request, we provided laboratory testing services for the subject project. Services were limited to the performance of testing of laboratory tests, selected at your discretion.

For this period, our involvement was limited to laboratory testing of two sample delivered to our laboratory on May 16, 2019. Laboratory tests were conducted in general accordance with methods listed on the attached *Laboratory Summary* sheet.

If you have questions regarding this report, please call.

Respectfully Submitted, Budinger & Associates, Inc.

Sallard

Terri Ballard Laboratory Manager

TJB/kah/Addressee – Kathy Sattler - <u>kathys@anateklabs.com</u>

Attachments: Soils Laboratory Summary - (1 page)

soils										
	BORATOI	RY SUMMAR	042519CBCS	042519CBTS						
LABORATORY NUMBER		-	19-0289	19-0290						
SAMPLED BY			Client	Client						
SAMPLE TYPE			Bulk	Bulk						
DATE RECEIVED			5/16/19	5/16/19						
FIELD SAMPLE ID			CBCS1	CBTS1						
			CBCS2	CBTS2						
			CBCS3	CBTS3						
			North	South						
		Test								
	Units	Method								
SIEVE ANALYSIS		ASTM D6913								
S	1"	%								
Ι	3/4"		100	100						
Е	1/2"	Р	98	95						
V	3/8"	А	96	92						
Е	#4	S	90	82						
	#10	S	78	67						
S	#16	Ι	65	54						
Ι	#30	Ν	44	36						
Z	#40	G	35	28						
Е	#100		11	11						
	#200		4.9	5.4						

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Login Report

Customer Name	: CITY OF ELLENSBURG	6		Order	ID: 190508045
	1401 E TRENT AVE, SU	JITE 101		Order Da	te: 5/8/2019
	SPOKANE	WA	99202		
Contact Name	: JON MORROW			Project Name: STR	EET SWEEPING VS
Comment	:			CAI	CH BASIN
Sample #: 19050	8045-001 Customer Sample	#: 0425193	SSTS1		
Recv'd: 🔽 N	latrix: Solid Collect	or: GORI	DON CRANE	Date Collected: 5/2	/2019
Quantity: 1	Date Received: 5/8/2019	1:15:00 PN	Л	Time Collected: 9:2	0 AM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	5/20/2019	<u>Normal (~10 Days)</u>
%Moisture		S	%moisture	5/20/2019	<u>Normal (~10 Days)</u>
Sample #: 190508	B045-002 Customer Sample	#: 042519	9SSTS2		
Recv'd: 🔽 N	latrix: Solid Collect	or: GORI	DON CRANE	Date Collected: 5/2	/2019
Quantity: 1	Date Received: 5/8/2019	1:15:00 PN	Л	Time Collected: 9:2	0 AM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	5/20/2019	<u>Normal (~10 Days)</u>
%Moisture		S	%moisture	5/20/2019	<u>Normal (~10 Days)</u>
Sample #: 19050	3045-003 Customer Sample	#: 042519	955753		
Recv'd: 🖌 N	latrix: Solid Collect	or: GORI	DON CRANE	Date Collected: 5/2	/2019
Quantity: 1	Date Received: 5/8/2019	1:15:00 PN	Л	Time Collected: 9:2	0 AM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	5/20/2019	Normal (~10 Davs)
%Moisture		s	%moisture	5/20/2019	Normal (~10 Days)
		0		5/20/2015	10 Days)

Customer	Name:	CITY OF ELLEN	NSBURG		Order	ID: 190508045
		1401 E TRENT	AVE, SUITE 1	01	Order D	ate: 5/8/2019
		SPOKANE	N	NA 99202		
Contact	Name:	JON MORROW	1		Project Name: ST	REET SWEEPING VS
Com	nment:				CA	TCH BASIN
Sample #:	1905080	45-004 Custome	r Sample #: 042	2519CBTS1		
Recv'd:	Mat	trix: Solid	Collector: G	ORDON CRANE	Date Collected: 5/	/2/2019
Quantity:	1	Date Received:	5/8/2019 1:15:00) PM	Time Collected: 9:	15 AM
Comment:						
Test			Lab	Method	Due Date	Priority
% SOLIDS			S 6	% solids	5/20/2019	<u>Normal (~10 Days)</u>
munitie			3	moisture	5/20/2019	<u>Normal (~10 Days)</u>
Sample #:	1905080	45-005 Custome	r Sample #: 042	2519CBTS2		
Recv'd:	✓ Mat	trix: Solid	Collector: G	ORDON CRANE	Date Collected: 5/	/2/2019
Quantity:	1	Date Received:	5/8/2019 1:15:00	D PM	Time Collected: 9:	15 AM
Comment:						
T (1 - 1			Datasita
			Lab	Wethod % solids	5/20/2019	Priority
%Moisture			s	%moisture	5/20/2019	<u>Normal (~10 Days)</u> Normal (~10 Days)
	4005000		-	,		<u>Hormar(To Bayo)</u>
Sample #:	1905080	45-006 Custome	r Sample #: 042	2519CBTS3		
Recv'd:	✓ Mat	trix: Solid	Collector: G	ORDON CRANE	Date Collected: 5/	/2/2019
Quantity:	1	Date Received:	5/8/2019 1:15:00	D PM	Time Collected: 9:	15 AM
Comment:						
Test			Lab	Method	Due Date	Priority
% SOLIDS			S	% solids	5/20/2019	Normal (~10 Days)
%Moisture			S	%moisture	5/20/2019	Normal (~10 Days)
Sample #:	1905080	45-007 Custome	r Sample #: C	OMPOSITE: CBTS1, 2	2, 3	
Pecyld:	Mət	trix. Solid	Collector: G		Date Collected: 5	/2/2019
Quantity:	1	Date Received	5/8/2019 1:15:00		Time Collected:	2,2010
Comment:						
Test			Lab	Method	Due Date	Priority
%Moisture			S	%moisture	5/20/2019	<u>Normal (~10 Days)</u>

Customer	Name	: CITY OF ELLE	NSBURG		Orde	er ID: 190508045
		1401 E TRENT	AVE, SUITE	101	Order	Date: 5/8/2019
		SPOKANE		WA 9920	2	
Contact	Name	: JON MORROW	1		Project Name: S	TREET SWEEPING VS
Con	nment	:			C	ATCH BASIN
Sample #:	190508	045-008 Custome	er Sample #: 0	42519CBCS1		
Recv'd:	V Ma	atrix: Solid	Collector:	GORDON CRANE	Date Collected:	5/2/2019
Quantity:	1	Date Received:	5/8/2019 1:15:	00 PM	Time Collected:	9:15 AM
Comment:						
_						
			Lat	o Method	Due Date	Priority
%Moisture			S	% solids	5/20/2019	<u>Normal (~10 Days)</u> Normal (_10 Days)
/iniciotare				, sinoistare	0/20/2013	<u>Normai (~10 Days)</u>
Sample #:	190508	045-009 Custome	r Sample #: 0	42519CBCS2		
Recv'd:	V Ma	atrix: Solid	Collector:	GORDON CRANE	Date Collected:	5/2/2019
Quantity:	1	Date Received:	5/8/2019 1:15:	00 PM	Time Collected:	9:15 AM
Comment:						
Test			Lak	Mathad	Due Dete	Dei anitu
			Ldi) wethod	Due Date	Priority
% SOLIDS			S	% solids	5/20/2019	Normal (~10 Days)
% SOLIDS %Moisture			S S	% solids %moisture	5/20/2019 5/20/2019	<u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
% SOLIDS %Moisture Sample #:	190508	045-010 Custome	s S	% solids %moisture	5/20/2019 5/20/2019	<u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
% SOLIDS %Moisture Sample #:	190508	045-010 Custome	S S S S S	% solids %moisture 42519CBCS3	5/20/2019 5/20/2019	<u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
% SOLIDS %Moisture Sample #: Recv'd:	190508 ✔ Ma	045-010 Custome atrix: Solid	S S S Collector:	42519CBCS3	Due Date 5/20/2019 5/20/2019 Date Collected:	5/2/2019
% SOLIDS %Moisture Sample #: Recv'd: Quantity:	190508 ✓ M a 1	045-010 Custome atrix: Solid Date Received:	S S or Sample #: Collector: 5/8/2019 1:15:	% solids %moisture 42519CBCS3 GORDON CRANE 00 PM	Due Date 5/20/2019 5/20/2019 Date Collected: Time Collected:	Normal (~10 Days) Normal (~10 Days) 5/2/2019 9:15 AM
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Customer Name: CITY OF ELLENSBURG

Order ID: 190508045

5/8/2019

1401 E TRENT AVE, SUITE 101 SPOKANE WA

99202

Contact Name: JON MORROW

Comment:

Project Name: STREET SWEEPING VS CATCH BASIN

Order Date:

SAMPLE CONDITION RECORD

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature of the sample(s)? (°C)	9.0
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Labels and chain agree?	Yes
Total number of containers?	9

Anatek
Labs
Inc.

Chain of	^c Custody	Record
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○ 1282 Alturas Drive, Moscow ID 83843 (208) 883-2839 FAX 882-9246
 ○ 504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433
 ○ ASIN

90508	045 C	ELL Last	5/20/2019
st SAMP	5/2/2019	1st RCVD	5/8/2019

Compa	Company Name: City of Ellensburg/Osborn Consulting			Project Manager: Jon Morrow				Please refer to our normal turn around times at:											
Addres	s:			PO Box 48026		Proje	ect Nan	ne & i	#:	Stre	et Swe	eeping	vs Ca	tch B	asin	http://www.anateklabs.com/services/guidelines/reporting.asp			
City:		Spokane		State: WA Zip	99208	Ema	Email Address : morrowj@ci.ellensburg.wa.us				sburg	Normal *All rush orderPhone Next Day* requests must beMail							
Phone	:		(509) 995-0557		Purc	hase C	order #	: :							2nd Day* prior approvedFax Other* Email			
Fax:						Sam	pler Na	ame &	phone	e:	Gordo	n Crane	e 509	962-7	7236				
	A State	Provid	e Sa	ample Descripti	on	an a share sh	Carles -	臺灣	List	Ana	lyses	Reques	sted	No.		Note Special Instructions/Comments			
		Catch	basir	n and street sedimen	t	Prese	ervative:									Please send a copy of the results to			
						ner	L L	tent 16	1422	tent 74						Jon at email above and Aimee at			
						ntai	>	Con D221	TMD	Cont D29						aimeen@osbornconsulting.com			
						- ပိ	hge	sture	SAC	ganic STM						Supr			
Lab	Sar	mple Identifica	tion	Sampling Date/Tim	e Matrix	# of	Sar	Moi	PSI	0°0						JWIS			
	Oui	042519SSTS1		5-2-1992	6 solid			×								For ASTM D422 testing, combine all 042519CBTS			
		042519SSTS2		1 9:2) solid			×								samples, then combine all 042519CBCS samples and use			
	- 5	042519SSTS3		9:0	g solid			×								the following sieve sizes:			
		042519CBTS1		0.1	5 solid	1		×	×	×						>2mm, 0.25-2mm, 0.075-0.25mm, <0,075 mm			
A STATE		042519CBTS2		1	solid		<u> </u>	×								For ASTM D2974 testing, combine all CBTS			
121-17-191 1-1-1-191		042519CBTS3			solid	+		×								samples, then combine all CBCS samples.			
	K	042519CBCS1	-		solid	+	<u>+</u>	x	×	×									
Constanting of the second	-	042519CBCS2			solid	+		×	-							Inspection Checklist			
and	2	042519CBCS3		\checkmark	solid	+		×				_				Received Intact? (Y N			
an and	5	04201000000			Cond	+										Labels & Chains Agree? Y N			
									<u> </u>							Containers Sealed? Y N			
A Barris	-					-	-	-	-							VOC Head Space? Y N			
The sector						-	+		 	<u> </u>		_				URSICI			
日本の公式です。 19月2日 - 19月			Print	red Name	Signature	5.5	-	1. 30	Service Service	Com	pany		Date	34.50	Time	010/0/1			
Delin	nuich	and by	6	Jan Ca	4.5.	10				0	it. M	F Fhr	5-7	7-19	10:15	Temperature (°C): 9.0 dia 04			
Rein	juisi	hy	1	and Crane	- MALDA	A.	an	h			PMA	tol.	6-8	7-19	1315	Preservative:			
Polin		and by	W.	Entry DE		()	(0			IV V MA	AVAL 2	1	· · · ·	121-				
Rece	ived	by		J				-			{					Date & Time: 5-8-19 1415			
D. I		-,									1.					Inspected By: Man			
Relin	quist	ned by								-	(-	-					
Rece	ived	by																	

June 2019 Data Collection Event

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	CITY OF ELLEN	ISBURG			Batch #:	190703030	6	
Address:	1401 E TRENT SPOKANE, WA	AVE, SUIT 99202	E 101		Project Name:	STREET S CATCH B/	SWEEPINC ASIN	SVS
Attn:	JON MORROW							
			Analytical R	esults F	Report			
Sample Number Client Sample ID Matrix Comments	190703036-001 062419SSTS1 Solid]	Sampling Date Sampling Time Sample Location	7/2/2019 10:30 AM	Date/Ti Extract	me Received ion Date	7/3/2019	1:10 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		94.1 5.9	% %	0.1 0.1	7/8/2019 11:00:00 AM 7/8/2019 11:00:00 AM	KNP KNP	% solids %moisture	
Sample Number Client Sample ID Matrix Comments	190703036-002 062419SSTS2 Solid]	Sampling Date Sampling Time Sample Location	7/2/2019 10:30 AM	Date/Time Received Extraction Date		7/3/2019	1:10 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		75.4 24.6	% %	0.1 0.1	7/8/2019 11:00:00 AM 7/8/2019 11:00:00 AM	KNP KNP	% solids %moisture	
Sample Number Client Sample ID Matrix Comments	190703036-003 062419SSTS3 Solid]	Sampling Date Sampling Time Sample Location	7/2/2019 10:30 AM	Date/Ti Extract	me Received ion Date	7/3/2019	1:10 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
0/ 1/1					· · · · · · · · · · · · · · · · · · ·			
% solids %moisture		92.6 7.4	%	0.1	7/8/2019 11:00:00 AM 7/8/2019 11:00:00 AM	KNP KNP	% solids %moisture	
% solids %moisture Sample Number Client Sample ID Matrix Comments	190703036-005 062419CBTS1 Solid	92.6 7.4	% % Sampling Date Sampling Time Sample Location	0.1 0.1 7/2/2019 10:40 AM	7/8/2019 11:00:00 AM 7/8/2019 11:00:00 AM Date/Ti Extract	KNP KNP me Received ion Date	% solids %moisture 7/3/2019	1:10 PM
% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter	190703036-005 062419CBTS1 Solid	92.6 7.4	% % Sampling Date Sampling Time Sample Location Units	0.1 0.1 7/2/2019 10:40 AM	7/8/2019 11:00:00 AM 7/8/2019 11:00:00 AM Date/Ti Extract	KNP KNP me Received ion Date	% solids %moisture 7/3/2019 Method	1:10 PM Qualifier
% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids	190703036-005 062419CBTS1 Solid	92.6 7.4	% % Sampling Date Sampling Time Sample Location Units %	0.1 0.1 7/2/2019 10:40 AM PQL 0.1	7/8/2019 11:00:00 AM 7/8/2019 11:00:00 AM Date/Ti Extract Analysis Date 7/8/2019 11:00:00 AM	KNP KNP me Received ion Date Analyst KNP	% solids %moisture 7/3/2019 Method % solids	1:10 PM Qualifier

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Client: Address: Attn:	CITY OF ELLEN 1401 E TRENT SPOKANE, WA JON MORROW	ISBURG AVE, SUIT 99202	E 101		Batch #: Project Name:	t #: 190703036 ct Name: STREET SWEEPING VS CATCH BASIN			
			Analytical R	esults F	Report				
Sample Number Client Sample ID Matrix Comments	190703036-006 062419CBTS2 Solid]	Sampling Date Sampling Time Sample Locatior	7/2/2019 10:40 AM	Date/Time Received Extraction Date		7/3/2019	1:10 PM	
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier	
% solids %moisture		60.5 39.5	%	0.1 0.1	7/8/2019 11:00:00 AM 7/8/2019 11:00:00 AM	KNP KNP	% solids %moisture		
				-					
Sample Number Client Sample ID Matrix Comments	190703036-007 062419CBTS3 Solid]	Sampling Date Sampling Time Sample Locatior	7/2/2019 10:40 AM 1	Date/Time Received Extraction Date		7/3/2019	1:10 PM	
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier	
% solids %moisture		61.1 38.9	% %	0.1 0.1	7/8/2019 11:00:00 AM 7/8/2019 11:00:00 AM	KNP KNP	% solids %moisture		
Sample Number Client Sample ID Matrix Comments	190703036-008 062419CBCS1 Solid]	Sampling Date Sampling Time Sample Locatior	7/2/2019 10:35 AM	Date/Ti Extract	Date/Time Received Extraction Date		1:10 PM	
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier	
% solids %moisture		98.1 1.9	% %	0.1 0.1	7/8/2019 11:00:00 AM 7/8/2019 11:00:00 AM	KNP KNP	% solids %moisture		
Sample Number	_190703036-009		Sampling Date	7/2/2019	Date/Ti	me Received	7/3/2019	1:10 PM	
Client Sample ID Matrix Comments	062419CBCS2 Solid		Sampling Time Sample Location	10:35 AM 1	Extract	ion Date			
Client Sample ID Matrix Comments Parameter	062419CBCS2 Solid	Result	Sampling Time Sample Location Units	10:35 AM	Extract Analysis Date	ion Date Analyst	Method	Qualifier	

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Client:CITY OF ELLENSBURGBatch #:190703036Address:1401 E TRENT AVE, SUITE 101
SPOKANE, WA 99202Project Name:STREET SWEEPING VS
CATCH BASINAttn:JON MORROWVV

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	190703036-010 062419CBCS3 Solid]	Sampling Date Sampling Time Sample Locatior	7/2/2019 10:35 AM	Date/Ti Extract	me Received ion Date	7/3/2019	1:10 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		96.7	%	0.1	7/8/2019 11:00:00 AM	KNP	% solids	
%moisture		3.3	%	0.1	7/8/2019 11:00:00 AM	KNP	%moisture	

Authorized Signature

athleen ()

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated.

Soil/solid results are reported on a dry-weight basis unless otherwise noted.

	SOILS									
	LA	BORATORY S	062419CBS CS	062419CBS TS	062419SSTS					
LABORATORY NUMBER			19-0553	19-0554	19-0555					
SAMPLED BY			Client	Client	Client					
SAMPLE TYPE			Bulk	Bulk	Bulk					
DATE RECEIVED			7/23/19	7/23/19	7/23/19					
FIELD SAMPLE ID			CB control	CB TEST	SSTS					
CLIENT SAMPLE DATE			6/24/19	6/24/19	7/2/19					
			North	South	South					
		Test	Norui	Couli						
	<u>Units</u>	Method								
SIEVE ANALYSIS		ASTM D6913								
S	1"	%								
Ι	3/4"			100	100					
E	1/2"	Р	100	98	97					
V	3/8"	А	97	96	86					
E	#4	S	94	95	71					
	#10	S	82	88	43					
S	#16	Ι	74	60	30					
Ι	#30	Ν	68	50	19					
Z	#40	G	63	47	15					
Е	#100		46	36	8					
	#200		30	27	4.5					

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Login Report

Customer Name	E CITY OF ELLENSBUR		Order	ID: 190703036	
	1401 E TRENT AVE, SPOKANE		Δ <u>00202</u>	Order Da	ite: 7/3/2019
Contact Name Comment	e: JON MORROW	vv	A 33202	Project Name: STR CAT	REET SWEEPING VS CH BASIN
Sample #: 19070	3036-001 Customer Sample	e #: 0624	19SSTS1		
Recv'd: 🗸 N	fatrix: Solid Colled	ctor: GO	RDON CRANE	Date Collected: 7/2	/2019
Quantity: 1	Date Received: 7/3/201	9 1:10:00 F	PM	Time Collected: 10:	30 AM
Comment:					
Test		l ah	Method	Due Date	Priority
% SOLIDS		S	% solids	7/15/2019	Normal (~10 Davs)
%Moisture		S	%moisture	7/15/2019	<u>Normal (~10 Days)</u>
Sample #: 19070	3036-002 Customer Sample	e #: 0624	419SSTS2		
Decide 🗔 N				Data Callastada 7/0	/2010
Quantity: 1	Date Received: 7/3/201			Time Collected: 1/2	30 AM
Comment:		19 1.10.001		Time Conected. 10.	
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	7/15/2019	<u>Normal (~10 Days)</u>
%Moisture		S	%moisture	7/15/2019	<u>Normal (~10 Days)</u>
Sample #: 19070	3036-003 Customer Sample	e #: 062	419SSTS3		
Recv'd: 🖌 M	fatrix: Solid Colle	ctor: GO	RDON CRANE	Date Collected: 7/2	/2019
Quantity: 1	Date Received: 7/3/201	9 1:10:00 F	PM	Time Collected: 10:	30 AM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	7/15/2019	Normal (~10 Days)
%Moisture		S	%moisture	7/15/2019	Normal (~10 Days)

Customer Nar	ne: CITY OF ELLEN	NSBURG		Ord	ler ID: 190703036
	1401 E TRENT	AVE, SUITE	101	Order	Date: 7/3/2019
	SPOKANE		WA 9	99202	
Contact Na	ne: JON MORROW			Project Name:	STREET SWEEPING VS
Comme	ent:			(CATCH BASIN
Sample #: 190	703036-004 Custome	r Sample #:	COMPOSITE: S	STS1,2,3	
Recv'd: 🗸	Matrix: Solid	Collector:	GORDON CRA	NE Date Collected:	7/2/2019
Quantity: 1	Date Received:	7/3/2019 1:10:	00 PM	Time Collected:	10:30 AM
Comment:					
					- • •
lest		La	b Method	Due Date	Priority
HOLD		3	noid	7/15/2019	<u>Normal (~10 Days)</u>
Sample #: 190	703036-005 Custome	r Sample #:	062419CBTS1		
Recv'd:	Matrix: Solid	Collector:	GORDON CRAI	NE Date Collected:	7/2/2019
Quantity: 1	Date Received:	7/3/2019 1:10:	00 PM	Time Collected:	10:40 AM
Comment:					
Test		1	h Mathad	Due Dete	Dui a vitu
		La	% solids	7/15/2019	
%Moisture		S	%moisture	e 7/15/2019	<u>Normal (~10 Days)</u> Normal (~10 Days)
, sinclotare		с Г	, inteletar		<u>Normal (~10 Days)</u>
Sample #: 190	703036-006 Custome	r Sample #:	062419CBTS2		
Recv'd:	Matrix: Solid	Collector:	GORDON CRAI	NE Date Collected:	7/2/2019
Quantity: 1	Date Received:	7/3/2019 1:10:	00 PM	Time Collected:	10:40 AM
Comment:					
Test		Lal	b Method	Due Date	Priority
% SOLIDS		S	% solids	7/15/2019	Normal (~10 Days)
%Moisture		S	%moisture	e 7/15/2019	<u>Normal (~10 Days)</u>
Sample #: 190	703036-007 Custome	r Sample #:	062419CBTS3		
Recv'd: 🗸	Matrix: Solid	L Collector:	GORDON CRAI	Date Collected:	7/2/2019
Quantity: 1	Date Received:	7/3/2019 1:10:	00 PM	Time Collected:	10:40 AM
Comment:					
				-	D • • •
		La	p Method		Priority
% JULIUS		5	% solids	7/15/2019	<u>Normai (~10 Days)</u> Normal (~10 Days)
TOWOISLUIE		5	7011101S(UF	- //15/2019	<u>Normai (~10 Days)</u>

Customer Name: CITY OF ELLENSBURG Order ID: 190703036 1401 E TRENT AVE, SUITE 101 Order Date: 7/3/2019 SPOKANE 99202 WA Project Name: STREET SWEEPING VS CATCH BASIN Contact Name: JON MORROW Comment: Sample #: 190703036-008 Customer Sample #: 062419CBCS1 Recv'd: Matrix: Solid Collector: GORDON CRANE Date Collected: 7/2/2019 \checkmark Quantity: 1 7/3/2019 1:10:00 PM **Time Collected:** Date Received: 10:35 AM Comment: Test Method Due Date Priority Lab % SOLIDS S % solids 7/15/2019 Normal (~10 Days) S 7/15/2019 %Moisture %moisture Normal (~10 Days) 190703036-009 Sample #: Customer Sample #: 062419CBCS2 Recv'd: \checkmark Matrix: Solid Collector: GORDON CRANE Date Collected: 7/2/2019 Quantity: 1 Date Received: 7/3/2019 1:10:00 PM **Time Collected:** 10:35 AM Comment: Method Due Date Priority Test Lab % SOLIDS s % solids 7/15/2019 Normal (~10 Days) S %Moisture %moisture 7/15/2019 Normal (~10 Days) 190703036-010 Sample #: Customer Sample #: 062419CBCS3 Collector: GORDON CRANE **Date Collected:** Recv'd: Matrix: Solid 7/2/2019 \checkmark Quantity: 7/3/2019 1:10:00 PM **Time Collected:** 1 **Date Received:** 10:35 AM Comment: Lab Method Due Date Priority Test % SOLIDS S % solids 7/15/2019 Normal (~10 Days)

S

%moisture

7/15/2019

Normal (~10 Days)

%Moisture

Customer Name: CITY OF ELLENSBURG

Order ID:

1401 E TRENT AVE, SUITE 101 SPOKANE WA

99202

Contact Name: JON MORROW

Project Name: STREET SWEEPING VS CATCH BASIN

Order Date:

Comment:

SAMPLE CONDITION RECORD

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature of the sample(s)? (°C)	10.0
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Labels and chain agree?	Yes
Total number of containers?	9

190703036

7/3/2019

	Anate	k		C	hain	of	Cus	tody	Rec	ord	!			ſ	90703 036 CELL Last 7/15/2019
	Lab In	s,	◯ 1282 A	lturas Drive,	Mosc	ow Il	D 838	43 (2	208) 88	83-28	39 FA	X 882	-9246		
Compa	Company Name: City of Ellepsburg							9202	(509)	838-3	3999 F	ASIN			
Address	dress:						Project Name & #: Otherst Currenting up Cotob Desin								http://www.anatekiabe.com/services/nuidelines/reporting.asp
huures	501 N Anderson St.						Street Sweeping vs Catch Basin								Phone
^{City:} Ellensburg ^{State:} WA ^{Zip:} 98926					morrowj@ci.ellensburg.wa.us								Normal *All rush orderMail		
Phone: (509) 929-3844					Purchase Order #:								2nd Day* prior approvedFax Other* Email		
ax:					Sam	pler N	ame &	phon	e: G	Gordo	on Crar	ne 509	9 962	-7236	
Provide Sample Description					1000	1. 1		List	Analy	yses	Requ	ested			Note Special Instructions/Comments
	Catch	basir	n and street sediment		Pres	ervative:									Please send a copy of the results to
Collection event 06-24-2019				Containers	mple Volume	isture Content \STMD2216	D ASTM D422							Aimee at aimeen@osbornconsulting com & Jon at email above	
ID	Sample Identific	ation	Sampling Date/Time	Matrix	0 #	Sai	Mo Mo	PS							
	062419SSTS1		7-2-19 10:30	solid			×	×				_			For ASTM D422 testing, combine all SSTS samples,
11-1-22	062419SSTS2		7-2-19 10:30	solid			×								and use the following sieve sizes:
	062419SSTS3		7-2-19 10:30	solid			×						<u> </u>		>2mm, 0.25-2mm, 0.075-0.25mm, <0.075mm
1224	062419CBTS1		7-2-19 10:40	solid			×					_			
-	062419CBTS2		7-2-19 10:40	solid			×								SWUS
New York	062419CBTS3		7-2-19 10:40	solid			×								A Para
222	062419CBCS		7-2-19 10:35	solid			×								* rec'a hroken
	062419CBCS		7-2-19 10:35	solid			×								Inspection Checklist
Star Star	062419CBCS	:	7-2-19 10:35	solid			×								Received Intact?
Arashi ga												_			Labels & Chains Agree?
4.00															Containers Sealed? N
															VOC Head Space? Y N
Hard Carl															11PS/c/i
and the second		Print	ed Name	Signature	1	2			Comp	bany	States)	Date	e	Time	019011
Relina	uished by	G	ander Grane	Morde	n/	ra	m	~	Cita	of	Ebr	17.	-2-19	2:30	Temperature (°C): <u>10.0</u> dlg04
Received by Wendy DZ Wen		ydy V			RA	Margetet 7-3-19 1310			3-19	13/0	Preservative:				
Reling	uished by	- VS	y or re		0	()							/	1210
Received by												Date & Time: <u>7-3-19</u> 1510			
Relina	uished by														Inspected By: M/y
Receiv	ved by														U
Recei	veu by								-						
1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	CITY OF ELLEN	ISBURG			Batch #:	19070101	5	
Address:	1401 E TRENT / SPOKANE WA	AVE, SUI 99202	TE 101		Project Name:	STREET S	SWEEPING ASIN	SVS
Attn:	JON MORROW	00202						
			Analytical R	esults R	eport			
Sample Number Client Sample ID Matrix Comments	190701015-001 062419CBS1 CS Solid]	Sampling Date Sampling Time Sample Locatio	6/24/2019 2:00 PM n	Date/⊺ Extrac	Fime Received ction Date	6/26/2019	11:20 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		93.5	%	0.1	7/15/2019	ARY	% solids	
%moisture		6.5	%	0.1	7/15/2019	ARY	%moisture	
Sample Number Client Sample ID Matrix Comments	190701015-002 062419CBS2 CS Solid]	Sampling Date Sampling Time Sample Locatio	6/24/2019 2:00 PM n	Date/⊺ Extrac	Fime Received	6/26/2019	11:20 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
		50 5	ā.	0.1	7/45/0040			
% solids		53.5	%	0.1	7/15/2019	ARY	% solids	
% solids %moisture		53.5 46.5	%	0.1	7/15/2019 7/15/2019	ARY ARY	% solids %moisture	
% solids %moisture Sample Number Client Sample ID Matrix Comments	190701015-003 062419CBS3 CS Solid	53.5 46.5	% % Sampling Date Sampling Time Sample Locatio	6/24/2019 2:00 PM	7/15/2019 7/15/2019 Date/7 Extrac	ARY ARY Fime Received	% solids %moisture 6/26/2019	11:20 AM
% solids %moisture Sample Number Client Sample ID Matrix Comments	190701015-003 062419CBS3 CS Solid	53.5 46.5	% % Sampling Date Sampling Time Sample Locatio	6/24/2019 2:00 PM	7/15/2019 7/15/2019 Date/7 Extrac	ARY ARY Fime Received	% solids %moisture 6/26/2019	11:20 AM
% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter	190701015-003 062419CBS3 CS Solid	53.5 46.5	% % Sampling Date Sampling Time Sample Location Units	0.1 0.1 6/24/2019 2:00 PM n	7/15/2019 7/15/2019 Date/T Extrac Analysis Date	ARY ARY Time Received ction Date Analyst	% solids %moisture 6/26/2019 Method	11:20 AM Qualifier
% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids	190701015-003 062419CBS3 CS Solid	53.5 46.5	% % Sampling Date Sampling Time Sample Location Units	0.1 0.1 6/24/2019 2:00 PM n PQL 0.1	7/15/2019 7/15/2019 Date/7 Extrac Analysis Date 7/15/2019 7/15/2019	ARY ARY Time Received ction Date Analyst ARY	% solids %moisture 6/26/2019 Method % solids	11:20 AM Qualifier
% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture	190701015-003 062419CBS3 CS Solid	53.5 46.5	% % Sampling Date Sampling Time Sample Location Units % %	0.1 0.1 6/24/2019 2:00 PM n PQL 0.1 0.1 0.1	7/15/2019 7/15/2019 Date/T Extrac Analysis Date 7/15/2019 7/15/2019	ARY ARY Time Received ction Date Analyst ARY ARY	% solids %moisture 6/26/2019 Method % solids %moisture	11:20 AM Qualifier
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% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID	190701015-003 062419CBS3 CS Solid 190701015-004 062419CBS4 CS	53.5 46.5	% % Sampling Date Sample Location Units % % Sampling Date Sampling Time	0.1 0.1 6/24/2019 2:00 PM 0.1 0.1 0.1 6/24/2019 2:00 PM	7/15/2019 7/15/2019 Date/T Extrac Analysis Date 7/15/2019 7/15/2019 Date/T Extrac	ARY ARY Fime Received ction Date Analyst ARY ARY Fime Received ction Date	% solids %moisture 6/26/2019 Method % solids %moisture 6/26/2019	11:20 AM Qualifier 11:20 AM
% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments	190701015-003 062419CBS3 CS Solid 190701015-004 062419CBS4 CS Solid	53.5 46.5	% % Sampling Date Sample Location Units % % Sampling Date Sampling Time Sample Location	0.1 0.1 6/24/2019 2:00 PM 0.1 0.1 0.1 6/24/2019 2:00 PM	7/15/2019 7/15/2019 Date/T Extrac Analysis Date 7/15/2019 7/15/2019 Date/T Extrac	ARY ARY Fime Received ction Date Analyst ARY ARY Fime Received ction Date	% solids %moisture 6/26/2019 Method % solids %moisture 6/26/2019	11:20 AM Qualifier 11:20 AM
% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments	190701015-003 062419CBS3 CS Solid 190701015-004 062419CBS4 CS Solid	53.5 46.5	% % Sampling Date Sample Location Units % % Sampling Date Sampling Time Sample Location	0.1 0.1 6/24/2019 2:00 PM 0.1 0.1 0.1 6/24/2019 2:00 PM	7/15/2019 7/15/2019 Date/7 Extrac 7/15/2019 7/15/2019 Date/7 Extrac	ARY ARY Fime Received ction Date Analyst ARY ARY Fime Received ction Date	% solids %moisture 6/26/2019 Method % solids %moisture 6/26/2019	11:20 AM Qualifier 11:20 AM
% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter	190701015-003 062419CBS3 CS Solid 190701015-004 062419CBS4 CS Solid	53.5 46.5 Result 3.4 96.6	% % Sampling Date Sample Location Units % % Sampling Date Sampling Time Sample Location Units	0.1 0.1 6/24/2019 2:00 PM 0.1 0.1 0.1 6/24/2019 2:00 PM n PQL	Analysis Date 7/15/2019 Date/T Extrac 7/15/2019 7/15/2019 Date/T Extrac Analysis Date	ARY ARY Fime Received ction Date Analyst ARY ARY Time Received ction Date Analyst	% solids %moisture 6/26/2019 Method % solids %moisture 6/26/2019 Method	11:20 AM Qualifier 11:20 AM Qualifier
% solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids	190701015-003 062419CBS3 CS Solid 190701015-004 062419CBS4 CS Solid	53.5 46.5 Result 3.4 96.6	% % Sampling Date Sample Location Units % Sampling Date Sampling Time Sample Location Units %	0.1 0.1 6/24/2019 2:00 PM 0.1 0.1 6/24/2019 2:00 PM 0.1 0.1 0.1	7/15/2019 7/15/2019 Date/7 Extrac 7/15/2019 7/15/2019 Date/7 Extrac Analysis Date 7/15/2019	ARY ARY Fime Received ction Date Analyst ARY Fime Received ction Date Analyst ARY	% solids %moisture 6/26/2019 Method % solids %moisture 6/26/2019 Method	11:20 AM Qualifier 11:20 AM Qualifier

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client: Address: Attn:	CITY OF ELLEN 1401 E TRENT / SPOKANE, WA JON MORROW	ISBURG AVE, SUIT 99202	E 101		Batch #: Project Name:	190701015 ne: STREET SWEEPING VS CATCH BASIN			
			Analytical R	esults R	eport				
Sample Number Client Sample ID Matrix Comments	190701015-006 062419CBS5 TS Solid		Sampling Date Sampling Time Sample Location	6/24/2019 2:00 PM n	Date/ Extra	Time Received ction Date	6/26/2019	11:20 AM	
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier	
% solids %moisture		61.6 38.4	% %	0.1 0.1	7/15/2019 7/15/2019	ARY ARY	% solids %moisture		
Sample Number Client Sample ID Matrix Comments	190701015-007 062419CBS6 TS Solid		Sampling Date Sampling Time Sample Location	6/24/2019 2:00 PM n	Date/ Extra	Time Received ction Date	6/26/2019	11:20 AM	
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier	
% solids %moisture		7.8 92.2	% %	0.1 0.1	7/15/2019 7/15/2091	ARY ARY	% solids %moisture		
Sample Number Client Sample ID Matrix Comments	190701015-008 062419CBS7 TS Solid]	Sampling Date Sampling Time Sample Location	6/24/2019 2:00 PM n	Date/ Extra	Time Received ction Date	6/26/2019	11:20 AM	
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier	
% solids %moisture		24.2 75.8	% %	0.1 0.1	7/15/2019 7/15/2019	ARY ARY	% solids %moisture		
Authorized Signature	Kathleen A. num Contaminant Level	Sattler, Lab N	Aanager						

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.

The results reported relate only to the samples indicated.

Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

SOILS									
	LA	BORATORY S	062419CBS CS	062419CBS TS	062419SSTS				
LABORATORY NUMBER			19-0553	19-0554	19-0555				
SAMPLED BY			Client	Client	Client				
SAMPLE TYPE			Bulk	Bulk	Bulk				
DATE RECEIVED			7/23/19	7/23/19	7/23/19				
FIELD SAMPLE ID			CB control	CB TEST	SSTS				
CLIENT SAMPLE DATE			6/24/19	6/24/19	7/2/19				
					South				
		Test	North	South					
	Units	Method							
SIEVE ANALYSIS		ASTM D6913							
S	1"	%							
Ι	3/4"			100	100				
Е	1/2"	Р	100	98	97				
V	3/8"	А	97	96	86				
Е	#4	S	94	95	71				
	#10	S	82	88	43				
S	#16	Ι	74	60	30				
Ι	#30	Ν	68	50	19				
Ζ	#40	G	63	47	15				
Е	#100		46	36	8				
	#200		30	27	4.5				

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Login Report

Customer	Name:		OF ELLEN		= 101	I		0	rder	ID: 190701015
		SPOK	ANF	AVE, 3011	WA	7	99202	Orde	er Da	ite. ////2019
Contact Com	Name: Iment:	JON M	ORROW		•••	·	00202	Project Name	: STR CAT	REET SWEEPING VS ICH BASIN
Sample #:	1907010	15-001	Customer	Sample #:	0624	419CBS1	CS			
Recv'd:	🗸 Ma	trix: Sol	id	Collector:	GOR	RDON CRA	NE	Date Collected:	6/2	24/2019
Quantity:	1	Date R	eceived:	6/26/2019 11	:20:00	AM		Time Collected:	2:0	00 PM
Comment:										
Test				La	ab	Method		Due Dat	e	Priority
% SOLIDS				S		% solids		7/10/201	19	Normal (~10 Days)
%Moisture				S		%moistu	re	7/10/201	19	<u>Normal (~10 Days)</u>
Sample #:	1907010	15-002	Customer	Sample #:	0624	19CBS2 C	s			
Recv'd:	🔽 Ma	trix: Sol	id	L Collector:	GOR		NE	Date Collected:	6/2	24/2019
Quantity:	1	Date R	eceived:	6/26/2019 11	:20:00) AM		Time Collected:	2:0	00 PM
Comment:										
Test					b	Method			0	Priority
% SOLIDS				S	10	% solids		7/10/202	19	Normal (~10 Days)
%Moisture				S		%moistu	re	7/10/201	19	Normal (~10 Days)
Sample #:	1907010	15-003	Customer	Sample #:	0624	44000000				<u> </u>
Sample #.	1507010	10-000	Customer	Sample #.	0024	419CB33 (.5			
Recv'd:	✓ Ma	trix: Sol	id	Collector:	GOR	RDON CRA	NE	Date Collected:	6/2	24/2019
Quantity:	1	Date R	eceived:	6/26/2019 11	:20:00) AM		Time Collected:	2:0	00 PM
Comment:										
Test				La	ab	Method		Due Dat	e	Priority
% SOLIDS				S		% solids		7/10/202	19	Normal (~10 Days)
%Moisture				S		%moistu	re	7/10/201	19	<u>Normal (~10 Days)</u>

Customer	Nam	e: CITY C	OF ELLEN	ISBURG			Or	der IC	D: 190701015
		1401 E	TRENT	AVE, SUITE	E 101		Orde	r Date	e: 7/1/2019
		SPOK	ANE		WA	99202			
Contact	Nam	ne: JON M	IORROW				Project Name:	STRE	ET SWEEPING VS
Con	nmer	nt:					-	CATC	CH BASIN
	-								
Sample #:	1907	01015-004	Customer	r Sample #:	06241	9CBS4 CS			
Recv'd:	✓	Matrix: Sol	lid	Collector:	GORE	OON CRANE	Date Collected:	6/24/	/2019
Quantity:	1	Date R	eceived:	6/26/2019 11:	:20:00 /	λM	Time Collected:	2:00	PM
Comment:									
Test				La	ab	Method	Due Date	9	Priority
% SOLIDS				S		% solids	7/10/201	9	Normal (~10 Days)
%Moisture				S		%moisture	7/10/201	9	Normal (~10 Days)
Sample #	1907	01015-005	Customer	Sample #	COME	POSITE: CB#1.2.3	4 CONTROL		
campio "i							,,		
Recv'd:		Matrix: Sol	lid	Collector:	GORE	OON CRANE	Date Collected:	6/24/	/2019
Quantity:	1	Date R	eceived:	6/26/2019 11:	:20:00 /	AM	Time Collected:	2:00	PM
Comment:									
Test				La	ab I	Method	Due Date	9	Priority
Test HOLD				La S	ab	Method hold	Due Date 6/24/201	9	Priority <u>Normal (~10 Days)</u>
Test HOLD Sample #:	1907	01015-006	Customer	La S r Sample #:	ab 06241	Method hold 9CBS5 TS	Due Dat 6/24/201	9	Priority <u>Normal (~10 Days)</u>
Test HOLD Sample #:	1907	01015-006	Customer	La S r Sample #:	ab 06241	Method hold 9CBS5 TS	Due Date 6/24/201	9	Priority <u>Normal (~10 Days)</u>
Test HOLD Sample #: Recv'd:	1907	01015-006 Matrix: Sol	Customer	La S r Sample #: Collector:	ab 06241 GORE	Method hold 9CBS5 TS DON CRANE	Due Date 6/24/201 Date Collected: Time Collected:	9 6/24/ 2:00	Priority <u>Normal (~10 Days)</u> /2019
Test HOLD Sample #: Recv'd: Quantity:	1907 ✓ 1	01015-006 Matrix: Sol Date Ro	Customer lid eceived:	La S r Sample #: [Collector: 6/26/2019 11:	ab 06241 GORE :20:00 /	Method hold 9CBS5 TS DON CRANE	Due Date 6/24/201 Date Collected: Time Collected:	9 6/24/ 2:00	Priority <u>Normal (~10 Days)</u> /2019 PM
Test HOLD Sample #: Recv'd: Quantity: Comment:	1907 ✓ 1	01015-006 Matrix: Sol Date R	Customer lid eceived:	La S r Sample #: Collector: 6/26/2019 11:	ab 06241 GORE :20:00 /	Method hold 9CBS5 TS DON CRANE	Due Date 6/24/201 Date Collected: Time Collected:	9 6/24/ 2:00	Priority <u>Normal (~10 Days)</u> /2019 PM
Test HOLD Sample #: Recv'd: Quantity: Comment: Test	1907 ✓ 1	01015-006 Matrix: Sol Date R	Customer lid eceived:	La S r Sample #: Collector: 6/26/2019 11: La	ab 06241 GORE :20:00 /	Method hold 9CBS5 TS DON CRANE AM	Due Date 6/24/201 Date Collected: Time Collected: Due Date	9 6/24/ 2:00	Priority <u>Normal (~10 Days)</u> /2019 PM Priority
Test HOLD Sample #: Quantity: Comment: Test % SOLIDS	1907 ✓ 1	01015-006 Matrix: Sol Date R	Customer lid eceived:	La S 7 Sample #: 6/26/2019 11: La S	ab 06241 GORE :20:00 / ab	Method hold 9 <i>CBS5 TS</i> DON CRANE AM Method	Due Date 6/24/201 Date Collected: Time Collected: Due Date 7/10/201	9 6/24/ 2:00 9	Priority <u>Normal (~10 Days)</u> /2019 PM Priority <u>Normal (~10 Days)</u>
Test HOLD Sample #: Recv'd: Quantity: Comment: Test % SOLIDS %Moisture	1907 ✓ 1	01015-006 Matrix: Sol Date R	Customer lid eceived:	La S r Sample #: Collector: 6/26/2019 11: La S S	ab 06241 GORE :20:00 /	Method hold 9CBS5 TS DON CRANE AM Method % solids %moisture	Due Date 6/24/201 Date Collected: Time Collected: Due Date 7/10/201 7/10/201	9 6/24/ 2:00 9 9	Priority <u>Normal (~10 Days)</u> /2019 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
Test HOLD Sample #: Recv'd: Quantity: Comment: Test % SOLIDS %Moisture	1907 ✓ 1	01015-006 Matrix: Sol Date R 01015-007	Customer lid eceived: Customer	La S 7 Sample #: 6/26/2019 11: La S S S	ab 06241 GORE :20:00 / ab 06241	Method PCBS5 TS PON CRANE AM Method % solids %moisture PCBS6 TS	Due Date 6/24/201 Date Collected: Time Collected: Due Date 7/10/201 7/10/201	9 6/24/ 2:00 9 9	Priority Normal (~10 Days) /2019 PM Priority Normal (~10 Days) Normal (~10 Days)
Test HOLD Sample #: Recv'd: Quantity: Comment: Test % SOLIDS %Moisture Sample #: Recv'd:	1907 ✓ 1 1907 ✓	01015-006 Matrix: Sol Date R 01015-007 Matrix: Sol	Customer lid eceived: Customer	La S r Sample #: Collector: 6/26/2019 11: La S S r Sample #: Collector:	ab 06241 GORE 20:00 / ab 06241 GORE	Method hold 9CBS5 TS DON CRANE AM Method % solids %moisture 9CBS6 TS DON CRANE	Due Date 6/24/201 Date Collected: Time Collected: 7/10/201 7/10/201 7/10/201	 a 9 6/24/ 2:00 a 9 9 6/24/ 	Priority Normal (~10 Days) /2019 PM Priority Normal (~10 Days) Normal (~10 Days) /2019
Test HOLD Sample #: Recv'd: Quantity: Comment: Test % SOLIDS %Moisture Sample #: Recv'd: Quantity:	1907	01015-006 Matrix: Sol Date R 01015-007 Matrix: Sol Date R	Customer lid eceived: Customer lid eceived:	La S S Sample #: 6/26/2019 11: 6/26/2019 11: S S S S S S S S S S S S S S S S S S	ab 06241 GORE :20:00 / ab 06241 GORE :20:00 /	Method hold 9CBS5 TS DON CRANE AM Method % solids %moisture 9CBS6 TS DON CRANE AM	Due Date 6/24/201 Date Collected: Time Collected: 7/10/201 7/10/201 Date Collected: Time Collected:	 6/24/ 2:00 9 9 6/24/ 2:00 	Priority Normal (~10 Days) /2019 PM Priority Normal (~10 Days) Normal (~10 Days) /2019 PM
Test HOLD Sample #: Recv'd: Quantity: Comment: ************************************	1907	01015-006 Matrix: Sol Date R 01015-007 Matrix: Sol Date R	Customer lid eceived: Customer lid eceived:	La S S Sample #: 2 6/26/2019 11: 6/26/2019 11: S S S S S S S S S S S S S S S S S S	ab 06241 GORE :20:00 / ab 06241 GORE :20:00 /	Method hold 9CBS5 TS DON CRANE AM Method % solids %moisture 9CBS6 TS DON CRANE	Due Date 6/24/201 Date Collected: Time Collected: 7/10/201 7/10/201 Date Collected: Time Collected:	 a 9 6/24/ 2:00 a 9 9 6/24/ 2:00 	Priority Normal (~10 Days) /2019 PM Priority Normal (~10 Days) Normal (~10 Days) /2019 PH
Test HOLD Sample #: Recv'd: Quantity: Comment: % SOLIDS %Moisture Sample #: Recv'd: Quantity: Comment:	1907 ✓ 1 1907 ✓ 1	01015-006 Matrix: Sol Date R 01015-007 Matrix: Sol Date R	Customer lid eceived: Customer lid eceived:	La S S Sample #: [Collector: 6/26/2019 11: S S S S S S S S S S S S S	ab 06241 GORE :20:00 / ab 06241 GORE :20:00 /	Method hold 9CBS5 TS DON CRANE AM Method % solids %moisture 9CBS6 TS DON CRANE AM	Due Date 6/24/201 Date Collected: Time Collected: 7/10/201 7/10/201 Date Collected: Time Collected:	 a 9 6/24, 2:00 a 9 9 6/24, 2:00 	Priority Normal (~10 Days) /2019 PM Priority Normal (~10 Days) Normal (~10 Days) /2019 PN
Test HOLD Sample #: Recv'd: Quantity: Comment: Test % SOLIDS %Moisture Sample #: Recv'd: Quantity: Comment: Test	1907 ✓ 1 1907 ✓ 1	01015-006 Matrix: Sol Date R 01015-007 Matrix: Sol Date R	Customer lid eceived: Customer lid eceived:	La S S Sample #: 6/26/2019 11: La S S S S S S S S Collector: 6/26/2019 11:	ab 06241 GORE 20:00 / ab 0 20:00 / GORE 20:00 /	Method hold 9CBS5 TS DON CRANE AM Method % solids %moisture 9CBS6 TS DON CRANE AM	Due Date 6/24/201 Date Collected: Time Collected: 7/10/201 7/10/201 Date Collected: Time Collected: Time Collected:	 a 9 6/24/ 2:00 a 6/24/ 2:00 a a 	Priority Normal (~10 Days) /2019 PM Priority Normal (~10 Days) Normal (~10 Days) Normal (~10 Days) PM
Test HOLD Sample #: Recv'd: Quantity: Comment: % SOLIDS %Moisture Sample #: Recv'd: Quantity: Comment: Test % SOLIDS	1907 ✓ 1 1907 ✓ 1	01015-006 Matrix: Sol Date R 01015-007 Matrix: Sol Date R	Customer lid eceived: Customer lid eceived:	La S 7 Sample #: [6/26/2019 11: 6/26/2019 11: S S 7 Sample #: [6/26/2019 11: 6/26/2019 11: 6/26/2019 11: 6/26/2019 11: Collector: 6/26/2019 11: 6/26/2019 11: 6/26/2019 11: 5 S	ab 06241 GORE 20:00 / ab 06241 GORE 20:00 /	Method hold 9CBS5 TS DON CRANE AM Method % solids %moisture 9CBS6 TS DON CRANE AM Method % solids	Due Date 6/24/201 Date Collected: Time Collected: 7/10/201 7/10/201 Date Collected: Time Collected: Time Collected: Due Date 7/10/201	 a 9 6/24/ 2:00 a 9 6/24/ 2:00 a 6/24/ 9 10 <li< td=""><td>Priority /2019 PM Priority Normal (~10 Days) /2019 PM /2019 /2019 PM /2019 PM /2019 PM Priority Normal (~10 Days) /2019 PM</td></li<>	Priority /2019 PM Priority Normal (~10 Days) /2019 PM /2019 /2019 PM /2019 PM /2019 PM Priority Normal (~10 Days) /2019 PM

Customer Name:	CITY OF ELLEN	ISBURG		Order	ID: 190701015
	1401 E TRENT	AVE, SUITE 10	1	Order Da	ate: 7/1/2019
	SPOKANE	W	A 99202		
Contact Name:	JON MORROW			Project Name: STR	REET SWEEPING VS
Commont				CAT	TCH BASIN
Comment:					
0	A.F. 000	0			
Sample #: 1907010	U15-008 Custome	Sample #: 0624	419CBS7 1S		
Recv'd: 🖌 Ma	trix: Solid	Collector: GO	RDON CRANE	Date Collected: 6/2	24/2019
Quantity: 1	Date Received:	6/26/2019 11:20:0	0 AM	Time Collected: 2:0	00 PM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		s	% solids	7/10/2019	<u>Normal (~10 Days)</u>
%Moisture		S	%moisture	7/10/2019	<u>Normal (~10 Days)</u>
Sample #: 1907010	015-009 Custome	Sample #: CO	MPOSITE: CB#5,6,7	TEST	
Recv'd: 🖌 Ma	trix: Solid	Collector: GO	RDON CRANE	Date Collected: 6/2	24/2019
Quantity: 1	Date Received:	6/26/2019 11:20:0	0 AM	Time Collected: 2:0	00 PM
Comment:					
Test		Lab	Method	Due Date	Priority
HOLD		S	hold	6/24/2019	<u>Normal (~10 Days)</u>
	SA	MPLE CON	DITION RECO	RD	
Samples rece	ived in a cooler?			No	
Samples rece	eived intact?			Yes	
Samples rece	eived with a COC?			Yes	
Samples rece	ived within holding tin	ne?		Yes	
Are all sample	e bottles properly pres	served?		Yes	
Labels and ch	nain agree?			Yes	
Total number	of containers?			7	

Sample Extraction Logbook

%Moisture instructions: Determine the percent moisture for each solid sample by oven drying about 10.0g of sample at 105°C for 2 hours. Allow to cool in a dessicator and re-weigh. Oven dry for an additional 30 minutes and re-weigh. Further drying is necessary if the two weighings differ by more than 1%.

Lab Sample ID	Dish	Dish wt	Dish +	Dry 1 (a)	Dry 2 (g)	% moisture	Sample	Weight	(g)	Method	Balance	Date/Time	Initials
1907/01/01/5001		21-20	202 J	301.8	301.8	6.5	965=	93.5		765	Balos	7-15-19	AKO
- 002	2	27221	2.710	0.5%	0.5Ka	46.5	4	535		1	WW		
- 002	3	264	201. 7	381.9	381.9	3.4		96.6			Baloz		7
- 003	ÿ	274	1129 100	384.6	384.6	38.8	ş	71.2				7.17.19	Ares
-006	5	272	384.3	340,96	310.96	38.4	Ĺ	el.Le					
-1007	6	274	429.10	857.0	297.0	92.2		7.2					
-00%	7	272	0.8 Kg	0.4kg	0.4Kg	758		21.2			WWD	1	
		A TRACK PROVIDENCE	1										
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					ARV							8	
				22									1

Comments:

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Chain	01	Cusioay	Kecora
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 ○ 504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433 ○ EASIN

90701	015	CELL	Last Due	7/10/2019
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1st SAMP 6/24/2019 1st RCVD 6/26/2019

Comp	any Name:	City of Ellensburg	9	Proje	ct Mar	ager:				Jon Mor	row			Please refer to our normal turn around times at:
Addre	ss: 50	01 N Anderson St.		Proje	ct Nan	ne & i	#:	Stree	et Sw	veeping	vs Catc	ch Ba	asin	http://www.anateklabs.com/services/guidelines/reporting.asp
City:	Ellensburg	State: WA Zip:	98926	Emai	I Addre	ess :		morr	owj@)ci.ellen	sburg.w	va.u	S	Normal *All rush orderPhone Next Day*Mail
Phone	9:	(509) 929-3844		Purcl	nase C	rder #	t:							
Fax:				Sam	oler Na	ime &	phon	e: C	Gordo	on Crane	e 509 90	62-7	236	
and the second second	Provide S	ample Description	·····································		ALLET.	and a second	List	Anal	yses	Reque	sted			Note Special Instructions/Comments
	Sediment	collected in filter socks		Containers	ble Volumerra	y Weight	ASTM D422							Please send a copy of the results to Aimee Navickis-Brasch (aimeen@osbornconsulting.com) & Jon
Lab	Sample Identification	Sampling Date/Time	Matrix	# of (Sam	ā	PSD							at email above
	062419CBS1 CS	6/24/19 2:00 PM	solid	1		×	×							For ASTM D422 testing, combine all CB# control samples,
1000 1000 1000 1000 1000 1000 1000 100	062419CBS2 CS	6/24/19 2:00 PM	solid			x								then combine all CB# test samples and use the following
Sec. Con	062419CBS3 CS	6/24/19 2:00 PM	solid			×								sieve sizes: >2mm, 0.25-2mm, 0.075-0.25mm, <0.075mm
	062419CBS4 CS	6/24/19 2:00 PM	solid			×								
The second	062419CBS5 TS	6/24/19 2:00 PM	solid			×	×							SUBS
	062419CBS6 TS	6/24/19 2:00 PM	solid			×								
	062419CBS7 TS	6/24/19 2:00 PM	solid			×								
														Inspection Checklist
														Received Intact? (Y) N Labels & Chains Agree? (Y) N Containers Sealed? (Y) N VOC Head Space? (Y) N
	Prin	ted Name	Signature	/	A		1992 - A	Com	pany		Date	T	ïme	VI JAC MI
Relin	quished by	ran Grane	- /110	don	In	en	-				6-25-	19 1	4:00 AM	Temperature (°C):
Rece	eived by	lendy OZ	Males	ud	40	12		A	nn	teh	6-26-1	9	1120	Preservative:
Relin	quished by	J	,,, ,	(J°.	0								
Rece	eived by													Date & Time: 6-26-19 /120
Relin	quished by													Inspected By: M/by
Rece	eived by													0

August 2019 Data Collection Event

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	CITY OF ELLEN	ISBURG			Batch #:	19091106	5	
Address:	1401 E TRENT SPOKANE, WA	AVE, SUI 99202	TE 101		Project Name:	STREET S CATCH B/	SWEEPING ASIN	S VS
Attn:	JON MORROW							
			Analytical R	esults F	Report			
Sample Number Client Sample ID Matrix Comments	190911065-001 082819SSTS1 Solid]	Sampling Date Sampling Time Sample Locatior	9/9/2019 12:00 PM	Date/Ti Extract	me Received ion Date	9/11/2019	1:40 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		90.0 10	% %	0.1	9/13/2019 9:40:00 AM 9/13/2019	NDE NDE	% solids %moisture	
Sample Number Client Sample ID Matrix Comments	190911065-002 082819SSTS2 Solid		Sampling Date Sampling Time Sample Location	9/9/2019 12:00 PM	Date/Ti Extract	me Received ion Date	9/11/2019	1:40 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		87.6 12.4	% %	0.1	9/13/2019 9:40:00 AM 9/13/2019	NDE NDE	% solids %moisture	
Sample Number Client Sample ID Matrix Comments	190911065-003 082819SSTS3 Solid		Sampling Date Sampling Time Sample Location	9/9/2019 12:00 PM	Date/Ti Extract	me Received ion Date	9/11/2019	1:40 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		92.8	%	0.1	9/13/2019 9:40:00 AM	NDE	% solids	
%moisture		7.2	%		9/13/2019	NDE	%moisture	
Sample Number Client Sample ID Matrix Comments	190911065-004 082819CBTS1 Solid		Sampling Date Sampling Time Sample Location	9/9/2019 12:05 PM 1	Date/Ti Extract	me Received ion Date	9/11/2019	1:40 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids TVS %moisture		56.5 13.4 43.5	% % %	0.1 0.01	9/13/2019 9:40:00 AM 9/13/2019 9:40:00 AM 9/13/2019	NDE NDE NDE	% solids SM2540E %moisture	

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Client:	CITY OF ELLENSBURG	Batch #:	190911065
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	190911065-005 082819CBTS2 Solid		Sampling Date Sampling Time Sample Locatior	9/9/2019 12:05 PM	Date/Ti Extract	me Received ion Date	9/11/2019	1:40 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		67.4	%	0.1	9/13/2019 9:40:00 AM	NDE	% solids	
TVS		10.8	%	0.01	9/13/2019 9:40:00 AM	NDE	SM2540E	
%moisture		32.6	%		9/13/2019	NDE	%moisture	
Sample Number Client Sample ID Matrix Comments	190911065-006 082819CBTS3 Solid		Sampling Date Sampling Time Sample Locatior	9/9/2019 12:05 PM	Date/Ti Extract	me Received ion Date	9/11/2019	1:40 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		63.9	%	0.1	9/13/2019 9:40:00 AM	NDE	% solids	
TVS		11.9	%	0.01	9/13/2019 9:40:00 AM	NDE	SM2540E	
%moisture		36.1	%		9/13/2019	NDE	%moisture	
Sample Number	100011065-008		Sampling Data	0/0/0040	Dete/Ti		0/44/0040	1.40 DM
Client Sample ID Matrix Comments	082819CBCS1]	Sampling Date Sampling Time Sample Location	9/9/2019 12:10 PM	Extract	ion Date	9/11/2019	1.40 PM
Client Sample ID Matrix Comments Parameter	082819CBCS1	Result	Sampling Date Sampling Time Sample Location	9/9/2019 12:10 PM PQL	Extract Analysis Date	ion Date Analyst	9/11/2019 Method	Qualifier
Client Sample ID Matrix Comments Parameter % solids	082819CBCS1		Sampling Date Sampling Time Sample Location Units	9/9/2019 12:10 PM PQL 0.1	Analysis Date 9/13/2019 9:40:00 AM	Analyst NDE	9/11/2019 Method % solids	Qualifier
Client Sample ID Matrix Comments Parameter % solids TVS	082819CBCS1	Result 92.1 5.80	Sampling Date Sampling Time Sample Location	9/9/2019 12:10 PM PQL 0.1 0.01	Analysis Date 9/13/2019 9:40:00 AM 9/13/2019 9:40:00 AM	Analyst NDE NDE	9/11/2019 Method % solids SM2540E	Qualifier
Client Sample ID Matrix Comments Parameter % solids TVS %moisture	082819CBCS1	Result 92.1 5.80 7.9	Sampling Date Sampling Time Sample Location	PQL 0.1 0.01	Analysis Date 9/13/2019 9:40:00 AM 9/13/2019 9:40:00 AM 9/13/2019	Analyst NDE NDE NDE NDE	Method % solids SM2540E %moisture	Qualifier
Client Sample ID Matrix Comments Parameter % solids TVS %moisture Sample Number Client Sample ID Matrix Comments	190911065-009 082819CBCS1 Solid	Result 92.1 5.80 7.9	Sampling Date Sampling Time Sample Location	9/9/2019 12:10 PM 0.1 0.01 9/9/2019 12:10 PM	Analysis Date 9/13/2019 9:40:00 AM 9/13/2019 9:40:00 AM 9/13/2019 Date/Tin Extract	Analyst NDE NDE NDE MDE me Received ion Date	9/11/2019 Method % solids SM2540E %moisture 9/11/2019	Qualifier 1:40 PM
Client Sample ID Matrix Comments Parameter % solids TVS %moisture Sample Number Client Sample ID Matrix Comments Parameter	190911065-009 082819CBCS1 Solid	Result 92.1 5.80 7.9	Sampling Date Sampling Time Sample Location % % % % Sampling Date Sampling Time Sample Location Units	9/9/2019 12:10 PM 0.1 0.01 9/9/2019 12:10 PM	Analysis Date 9/13/2019 9:40:00 AM 9/13/2019 9:40:00 AM 9/13/2019 Date/Tin Extract Analysis Date	Analyst Analyst NDE NDE NDE me Received ion Date	9/11/2019 Method % solids SM2540E %moisture 9/11/2019 Method	Qualifier 1:40 PM
Client Sample ID Matrix Comments Parameter % solids TVS %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids	190911065-009 082819CBCS1 Solid	Result 92.1 5.80 7.9	Sampling Date Sampling Time Sample Location	9/9/2019 12:10 PM 0.1 0.01 9/9/2019 12:10 PM 12:10 PM 0.1	Analysis Date 9/13/2019 9:40:00 AM 9/13/2019 9:40:00 AM 9/13/2019 Date/Tit Extract Analysis Date 10/1/2019	Analyst Analyst NDE NDE NDE me Received ion Date	9/11/2019 Method % solids SM2540E %moisture 9/11/2019 Method % solids	Qualifier 1:40 PM
Client Sample ID Matrix Comments Parameter % solids TVS %moisture Sample Number Client Sample ID Matrix Comments Parameter % solids TVS	190911065-009 082819CBCS1 Solid	Result 92.1 5.80 7.9	Sampling Date Sampling Time Sample Location	9/9/2019 12:10 PM 0.1 0.01 9/9/2019 12:10 PM 12:10 PM 0.1 0.1 0.01	Analysis Date 9/13/2019 9:40:00 AM 9/13/2019 9:40:00 AM 9/13/2019 Date/Tit Extract Analysis Date 10/1/2019 9/13/2019 9:40:00 AM	Analyst NDE NDE NDE me Received ion Date Analyst NDE	9/11/2019 Method % solids SM2540E %moisture 9/11/2019 9/11/2019 Method % solids SM2540E	Qualifier 1:40 PM

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Client:CITY OF ELLENSBURGBatch #:190911065Address:1401 E TRENT AVE, SUITE 101
SPOKANE, WA 99202Project Name:STREET SWEEPING VS
CATCH BASINAttn:JON MORROWVV

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	190911065-010 082819CBCS3 Solid]	Sampling Date Sampling Time Sample Locatior	9/9/2019 12:10 PM	Date/Ti Extract	me Received ion Date	9/11/2019	1:40 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		94.0	%	0.1	9/13/2019 9:40:00 AM	NDE	% solids	
TVS		4.60	%	0.01	9/13/2019 9:40:00 AM	NDE	SM2540E	
%moisture		6	%		9/13/2019	NDE	%moisture	

Authorized Signature

Kathlen a

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated. Soil/solid results are reported on a dry-weight basis unless otherwise noted.



Proudly serving the Inland Northwest since 1976

September 26, 2019

Kathy Sattler Anatek Labs, Inc 504 E Sprague Ave Ste D Spokane, WA 99202

Project Number L19089

PROJECT: Anatek 2019 Materials

SUBJECT: Results of Laboratory Testing Report #4

At your request, we provided laboratory testing services for the subject project. Services were limited to the performance of testing of laboratory tests, selected at your discretion.

For this period, our involvement was limited to laboratory testing of two samples delivered to our laboratory on September 18, 2019. Laboratory tests were conducted in general accordance with methods listed on the attached *Laboratory Summary* sheet.

If you have questions regarding this report, please call.

Respectfully Submitted, Budinger & Associates, Inc.

allain

Terri Ballard Laboratory Manager

TJB/kah/Addressee – Kathy Sattler - <u>kathys@anateklabs.com</u>

Attachments: Soils Laboratory Summary - (1 page)

LABORATORY SUMMARY										
LABORATORY NUMBER				19-0770	19-0771					
SAMPLED BY				Client	Client					
SAMPLE TYPE				Bulk	Bulk					
DATE RECEIVED				9/18/19	9/18/19					
FIELD SAMPLE ID				190911065-007	190911065-011					
				CBTS1	CBCS1					
				CBTS2	CBCS2					
				CBTS3	CBCS3					
			Test							
		<u>Units</u>	Method							
SIEVE ANALYSIS			ASTM D422							
S	1"	%								
Ι	3/4"									
E	1/2"	Р								
V	3/8"	А		100	100					
E	1/4"	S		91	95					
	#10	S		75	72					
S	#16	Ι		65	53					
Ι	#30	Ν		53	35					
Z	#40	G		44	27					
E	#100			25	14					
	#200			19	10					
	0.05mm			12	9.1					
	0.01mm			9.3	7.3					
	0.005mm			7.9	5.8					
	0.001mm			4.5	2.9					

SOILS I ABORATORY SUMMARY

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Login Report

Customer Name: CITY OF ELLE 1401 E TRENT SPOKANE	NSBURG AVE, SUITE 101 WA 99202	Order ID: Order Date:	190911065 9/11/2019
Contact Name: JON MORROW Comment:	V	Project Name: STREET S CATCH BA	WEEPING VS SIN
Sample #: 190911065-001 Custome Recv'd: Matrix: Solid Quantity: 1 Date Received: Comment:	er Sample #: 082819SSTS1 Collector: GORDON CRANE 9/11/2019 1:40:00 PM	Date Collected:9/9/2019Time Collected:12:00 PM	
Test	Lab Method	Due Date Priori	ty
% SOLIDS	S % solids	9/23/2019 Norn	nal (~10 Days)
%Moisture	S %moisture	9/23/2019 <u>Norn</u>	nal (~10 Days)
Sample #: 190911065-002 Custome Recv'd: Matrix: Solid Quantity: 1 Date Received: Comment:	er Sample #: 082819SSTS2 Collector: GORDON CRANE 9/11/2019 1:40:00 PM	Date Collected:9/9/2019Time Collected:12:00 PM	
Test	Lab Method	Due Date Priori	ty
% SOLIDS	S % solids	9/23/2019 <u>Norn</u>	nal (~10 Days)
%Moisture	S %moisture	9/23/2019 <u>Norn</u>	nal (~10 Days)
Sample #: 190911065-003 Custome	er Sample #: 082819SSTS3		
Recv'd: 🖌 Matrix: Solid	Collector: GORDON CRANE	Date Collected: 9/9/2019	
Quantity: 1 Date Received:	9/11/2019 1:40:00 PM	Time Collected: 12:00 PM	
Comment:			
Test	Lab Method	Due Date Priori	ty
% SOLIDS	S % solids	9/23/2019 Norn	nal (~10 Days)
%Moisture	S %moisture	9/23/2019 <u>Norn</u>	nal (~10 Days)

Contact Name: JON MORROW

Order	ID:	190911	065

9/11/2019

1401 E TRENT AVE, SUITE 101 SPOKANE WA

99202

Project Name: STREET SWEEPING VS CATCH BASIN

Order Date:

Comment:

Sample #:	190	911065-004	Customer	r Sample #:	0828	19CBTS1			
Recv'd:		Matrix: Sol	lid	Collector:	GOR	RDON CRANE		Date Collected:	9/9/2019
Quantity:	1	Date R	eceived:	9/11/2019 1	:40:00	PM		Time Collected:	12:05 PM
Comment:	:								
Test				I	Lab	Method		Due Date	Priority
% SOLIDS				\$	S	% solids		9/23/2019	<u>Normal (~10 Days)</u>
%Moisture				\$	S	%moisture		9/23/2019	<u>Normal (~10 Days)</u>
SOLIDS -	TVS			Ş	S	SM2540E		9/23/2019	<u>Normal (~10 Days)</u>
Sample #:	190	911065-005	Customer	Sample #:	0828	19CBTS2			
Recv'd:	✓	Matrix: Sol	lid	Collector:	GOR	RDON CRANE	E	Date Collected:	9/9/2019
Quantity:	1	Date R	eceived:	9/11/2019 1	:40:00	PM		Time Collected:	12:05 PM
Comment:									
Test				I	Lab	Method		Due Date	Priority
% SOLIDS				ę	S	% solids		9/23/2019	<u>Normal (~10 Days)</u>
%Moisture					S	%moisture		9/23/2019	<u>Normal (~10 Days)</u>
SOLIDS -	TVS				S	SM2540E		9/23/2019	<u>Normal (~10 Days)</u>
Sample #:	190	911065-006	Customer	Sample #:	0828	19CBTS3			
Recv'd:		Matrix: Sol	lid	Collector:	GOR	RDON CRANE		Date Collected:	9/9/2019
Quantity:	1	Date R	eceived:	9/11/2019 1	:40:00	PM		Time Collected:	12:05 PM
Comment:	1								
Test				I	Lab	Method		Due Date	Priority
% SOLIDS				Ş	S	% solids		9/23/2019	<u>Normal (~10 Days)</u>
%Moisture				\$	S	%moisture		9/23/2019	<u>Normal (~10 Days)</u>
SOLIDS -	TVS			5	S	SM2540E		9/23/2019	<u>Normal (~10 Days)</u>
Sample #:	190	911065-007	Customer	Sample #:	CON	IPOSITE: CB	FS1,2,3		
Recv'd:		Matrix: Sol	lid	Collector:	GOR	RDON CRANE		Date Collected:	9/9/2019
Quantity:	1	Date R	eceived:	9/11/2019 1	:40:00	PM		Time Collected:	12:05 PM
Comment:	:								
Test				I	Lab	Method		Due Date	Priority
HOLD				Ş	S	hold		9/23/2019	<u>Normal (~10 Days)</u>

1401 E TRENT AVE, SUITE 101 WA

99202

Order Date: 9/11/2019

SPOKANE

Contact Name: JON MORROW

Project Name: STREET SWEEPING VS CATCH BASIN

Comment:

Sample #: 19	0911065-008 Custome	r Sample #: 0828	19CBCS1		
Recv'd: 🗸	Matrix: Solid	Collector: GOI	RDON CRANE	Date Collected:	9/9/2019
Quantity: 1	Date Received:	9/11/2019 1:40:00	PM	Time Collected:	12:10 PM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	9/23/2019	<u>Normal (~10 Days)</u>
%Moisture		S	%moisture	9/23/2019	<u>Normal (~10 Days)</u>
SOLIDS - TVS	8	S	SM2540E	9/23/2019	<u>Normal (~10 Days)</u>
Sample #: 19	0911065-009 Custome	r Sample #: 0828	319CBCS2		
Recv'd: 🗸	Matrix: Solid	Collector: GOI	RDON CRANE	Date Collected:	9/9/2019
Quantity: 1	Date Received:	9/11/2019 1:40:00	PM	Time Collected:	12:10 PM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	9/23/2019	<u>Normal (~10 Days)</u>
%Moisture		S	%moisture	9/23/2019	<u>Normal (~10 Days)</u>
SOLIDS - TVS	5	S	SM2540E	9/23/2019	<u>Normal (~10 Days)</u>
Sample #: 19	0911065-010 Custome	r Sample #: 0828	319CBCS1		
Sample #: 19	0911065-010 Custome	r Sample #: 0828	319CBCS1 RDON CRANE	Date Collected:	9/9/2019
Sample #: 19 Recv'd: V Quantity: 1	0911065-010 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00	319CBCS1 RDON CRANE PM	Date Collected: Time Collected:	9/9/2019 12:10 PM
Sample #: 19 Recv'd: Quantity: 1 Comment:	0911065-010 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00	819CBCS1 RDON CRANE PM	Date Collected: Time Collected:	9/9/2019 12:10 PM
Sample #: 19 Recv'd: Quantity: 1 Comment:	0911065-010 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00	819CBCS1 RDON CRANE PM	Date Collected: Time Collected:	9/9/2019 12:10 PM
Sample #: 19 Recv'd: Quantity: 1 Comment: Test	0911065-010 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab	819CBCS1 RDON CRANE PM Method	Date Collected: Time Collected: Due Date	9/9/2019 12:10 PM Priority
Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: ✓	0911065-010 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S	819CBCS1 RDON CRANE PM Method % solids	Date Collected: Time Collected: Due Date 9/23/2019	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u>
Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: ✓ Test % SOLIDS %Moisture	0911065-010 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S S	819CBCS1 RDON CRANE PM Method % solids %moisture	Date Collected: Time Collected: Due Date 9/23/2019 9/23/2019	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: 1 Test % SOLIDS %Moisture SOLIDS - TVS	0911065-010 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S S S	B19CBCS1 RDON CRANE PM Method % solids %moisture SM2540E	Date Collected: Time Collected: Due Date 9/23/2019 9/23/2019 9/23/2019	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: 1 Test % SOLIDS %Moisture SOLIDS - TVS	0911065-010 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S S S S	B19CBCS1 RDON CRANE PM Method % solids %moisture SM2540E MPOSITE: CBCS1,2,3	Date Collected: Time Collected: Due Date 9/23/2019 9/23/2019 9/23/2019	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: Test % SOLIDS %Moisture SOLIDS - TVS Sample #: 19 Recv'd: ✓	0911065-010 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S S S r Sample #: COI	319CBCS1 RDON CRANE PM Method % solids %moisture SM2540E MPOSITE: CBCS1,2,3 RDON CRANE	Date Collected: Time Collected: Due Date 9/23/2019 9/23/2019 9/23/2019	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: 1 Comment: 1 Moisture SOLIDS - TVS Sample #: 19 Recv'd: ✓ Quantity: 1	0911065-010 Custome Matrix: Solid Date Received: 0911065-011 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S S r Sample #: CON Collector: GOI 9/11/2019 1:40:00	B19CBCS1 RDON CRANE PM Method % solids %moisture SM2540E MPOSITE: CBCS1,2,3 RDON CRANE PM	Date Collected: Time Collected: Due Date 9/23/2019 9/23/2019 9/23/2019 9/23/2019	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 9/9/2019 12:10 PM
Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: Test % SOLIDS %Moisture SOLIDS - TVS Sample #: 19 Recv'd: ✓ Quantity: 1 Comment:	0911065-010 Custome Matrix: Solid Date Received: 0911065-011 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S S r Sample #: COP Collector: GOI 9/11/2019 1:40:00	319CBCS1 RDON CRANE PM Method % solids %moisture SM2540E MPOSITE: CBCS1,2,3 RDON CRANE PM	Date Collected: Time Collected: Due Date 9/23/2019 9/23/2019 9/23/2019 9/23/2019	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 9/9/2019 12:10 PM
Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: 1 Test % SOLIDS %Moisture SOLIDS - TVS Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: 1	0911065-010 Custome Matrix: Solid Date Received: 0911065-011 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S S S r Sample #: CON Collector: GOI 9/11/2019 1:40:00	B19CBCS1 RDON CRANE PM Method % solids %moisture SM2540E MPOSITE: CBCS1,2,3 RDON CRANE PM	Date Collected: Time Collected: 9/23/2019 9/23/2019 9/23/2019 9/23/2019	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 9/9/2019 12:10 PM
Sample #: 19 Recv'd: Quantity: 1 Comment: Test % SOLIDS %Moisture SOLIDS - TVS Sample #: 19 Recv'd: Quantity: 1 Comment: Test	0911065-010 Custome Matrix: Solid Date Received: 0911065-011 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S S r Sample #: CON Collector: GOI 9/11/2019 1:40:00 Lab	B19CBCS1 RDON CRANE PM Method % solids %moisture SM2540E MPOSITE: CBCS1,2,3 RDON CRANE PM Method	Date Collected: Time Collected: Due Date 9/23/2019 9/23/2019 9/23/2019 9/23/2019 5 Date Collected: Time Collected: Due Date	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 9/9/2019 12:10 PM Priority
Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: 1 Test % SOLIDS %Moisture SOLIDS - TVS Sample #: 19 Recv'd: ✓ Quantity: 1 Comment: 1 Test HOLD	0911065-010 Custome Matrix: Solid Date Received: 0911065-011 Custome Matrix: Solid Date Received:	r Sample #: 0828 Collector: GOI 9/11/2019 1:40:00 Lab S S S r Sample #: CON Collector: GOI 9/11/2019 1:40:00 Lab S	B19CBCS1 RDON CRANE PM Method % solids %moisture SM2540E MPOSITE: CBCS1,2,3 RDON CRANE PM Method hold	Date Collected: Time Collected: 9/23/2019 9/23/2019 9/23/2019 9/23/2019 5 Date Collected: Time Collected: Time Collected: Due Date 9/23/2019	9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 9/9/2019 12:10 PM Priority <u>Normal (~10 Days)</u>

Order ID:

1401 E TRENT AVE, SUITE 101 SPOKANE WA

99202

Contact Name: JON MORROW

Project Name: STREET SWEEPING VS CATCH BASIN

Order Date:

Comment:

SAMPLE CONDITION RECORD

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature of the sample(s)? (°C)	3.3
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Labels and chain agree?	Yes
Total number of containers?	9

190911065

9/11/2019



Chain of Custody Record

○ 1282 Alturas Drive, Moscow ID 83843 (208) 883-2839 FAX 882-9246
 ○ 504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433
 ○ E ASIN

•	90911	065	CELL	Last Due	9/23/2019
---	-------	-----	------	-------------	-----------

1st SAMP 9/9/2019 1st RCVD 9/11/2019

STREET SWEEPING VS CATCH

Compai	ny Nam	e:	City of Ellensburg)	Proje	ect Mar	ager:				Jon Mor	rrow		
Address	S:	50	1 N Anderson St.		Project Name & # : Street Sweeping vs Catch Basin					eet Sv	veeping	http://www.anateklabs.com/services/guidelines/reporting.asp		
City:	Elle	ensburg	State: WA Zip:	98926	Email Address : morrowj@ci.ellensburg.wa.us					rrowj(@ci.ellen	Normal *All rush orderPhone Next Day* Mail		
Phone:		(509) 929-3844		Purc	hase C	rder #	# :						nd Day* requests must befax 2nd Day* prior approvedFax
Fax:					Sam	pler Na	me &	phon	e:	Gord	on Crane	e 509	962-7236	Other*
		Provide Sa	ample Description	· · · · · · · · · · · · · · · · · · ·	N. C. Sala	e de la companya de l La companya de la comp	State 2	List	Ana	lyses	Reque	sted		Note Special Instructions/Comments
		Catch basir Collectior	n and street sediment n event 08-27-2019		Containers est	avative:	ture Content 5TMD2216	ASTM D422	anic Content TM D2974					Please send a copy of the results to Aimee at aimeen@osbornconsulting. com & Jon at email above
Lab ID	Sample	e Identification	Sampling Date/Time	Matrix	# of	Sarr	Mois	PSD	Orge AS					
	2(082819SSTS1	9/9/19 /2:06	solid	1	4 oz.	×							For ASTM D422 testing, combine all CB control samples,
an der and	e2	082819SSTS2	9/9/19 */	solid	1	4 oz.	×							then combine all CB test samples and use the following
	5%)	082819SSTS3	9/9/19 "	solid	1	4 oz.	×							sieve sizes: 1", 3/4", 1/2", 3/8", 1/4", #10, #16, #30, #40,
and the second	x	082819CBTS1	9/9/19 12:05	solid	1	4 oz.	×	×	×					#100, #200, 0.05mm, 0.01mm, 0.005mm, 0.001mm
S. C.M.	8x2	082819CBTS2	9/9/19	solid	1	4 oz.	x	x	×					
a a cathor	120	082819CBTS3	9/9/19 (solid	1	4 oz.	×	×	×					SWDS
STATUS -	2)(082819CBCS1	9/9/19 12:10	solid	1	4 oz.	x	X	×					
5 3 C	3pt	082819CBCS2	9/9/19 ((solid	1	4 oz.	×	×	×					Inspection Checklist
	cor (082819CBCS3	9/9/19 "	solid	1	4 oz.	×	×	×					Received Intact? N Labels & Chains Agree? N Containers Sealed? N
A Constant														VOC Head Space? Y N
	10 N.C.4.10	Drint	ad Name	Signature	/ /	A Second	1000	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	Corr	nany		Date	Time	VPS/c/i
Contraction		E IIII		- Avente	10	C. Transie	11		6	+/	654 -	9 10	19 170	1 3.3 A. AY
Relinc	quished	by 🖵	ordingrane	Zugu	LA	nu	_			tyo	-C DUIZ	-7-10	7/1-20	
Recei	ved by	We	Way DZ	h/ser	Ne	h	<u></u>		4	MA	ten)	9-11-	-19 1340	Preservative: V
Relind	quished	by	J		0	C			-					Data & Tima: 9-11_19 14/11)
Recei	ved by													Date & Time
Relind	quished	by							<u> </u>					Inspected By: WG
Recei	ived by													U

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Client:	CITY OF ELLENSBURG	Batch #:	190830023
Address:	1401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
	SPOKANE, WA 99202		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	190830023-001 082819CBS1 CS Solid	Sampling Date Sampling Time Sample Locatior	8/29/2019 8:30 AM n	Date Extra	Time Received action Date	8/30/2019	10:45 AM
Parameter	Res	sult Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids	84	4 %	0.1	10/1/2019	ARY	% solids	
%moisture	16	6 %	0.1	9/19/2019	ARY	%moisture	

Sample Number Client Sample ID Matrix Comments	190830023-002 082819CBS2 CS Solid		Sampling Date Sampling Time Sample Locatior	te 8/29/2019 Date/Time Receiv ne 8:30 AM Extraction Date tion		e/Time Received raction Date	8/30/2019	10:45 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		44.9	%	0.1	10/1/2019	ARY	% solids	
%moisture		55.1	%	0.1	9/19/2019	ARY	%moisture	

Sample Number Client Sample ID Matrix Comments	190830023-003 082819CBS3 CS Solid]	Sampling Date Sampling Time Sample Locatior	8/29/2019 8:30 AM 1	Date Extra	/Time Received action Date	8/30/2019	10:45 AM
Parameter % solids %moisture		Result 29.6 70.4	Units %	PQL 0.1	Analysis Date 10/1/2019 9/19/2019	Analyst ARY	Method % solids	Qualifier

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Client: CITY OF E	LLENSBURG	Batch #:	190830023
Address: 1401 E TR	ENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
SPOKANE	, WA 99202		CATCH BASIN
Attn: JON MOR	ROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	190830023-004 082819CBS4 CS Solid		Sampling Date Sampling Time Sample Locatior	8/29/2019 8:30 AM	Date Extr	r/Time Received action Date	8/30/2019	10:45 AM
Parameter % solids %moisture		Result 59.9 40.1	Units %	PQL 0.1 0.1	Analysis Date 10/1/2019 9/19/2091	Analyst ARY ARY	Method % solids %moisture	Qualifier

Sample Number Client Sample ID Matrix Comments	190830023-005 082819CBS5 TS Solid]	Sampling Date Sampling Time Sample Locatior	8/29/2019 8:30 AM 1	Date Extra	Time Received action Date	8/30/2019	10:45 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids		75.7	%	0.1	10/1/2019	ARY	% solids	
%moisture		24.3	%	0.1	9/19/2019	ARY	%moisture	

Sample Number Client Sample ID Matrix Comments	190830023-006 082819CBS6 TS Solid]	Sampling Date Sampling Time Sample Locatior	8/29/2019 8:30 AM 1	Date Extra	/Time Received action Date	8/30/2019	10:45 AM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture		51.2 48.8	% %	0.1 0.1	10/1/2019 9/19/2019	ARY ARY	% solids %moisture	

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Client: Cl	ITY OF ELLENSBURG	Batch #:	190830023
Address: 14	401 E TRENT AVE, SUITE 101	Project Name:	STREET SWEEPING VS
SI	POKANE, WA 99202		CATCH BASIN
Attn: JC	ON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	190830023-007 082819CBS7 TS Solid		Sampling Date Sampling Time Sample Locatior	8/29/2019 8:30 AM 1	Date Extr	e/Time Received action Date	8/30/2019	10:45 AM
Parameter % solids		Result	Units %	PQL	Analysis Date	Analyst	Method % solids	Qualifier
%moisture		19.4	%	0.1	9/19/2019	ARY	%moisture	

Authorized Signature

Kathlen a l-Hb

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated.

Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Login Report

Customer Name	CITY OF ELLENSBURG			Order	ID: 190830023
	1401 E IRENI AVE, SU	11E 10	1	Order Da	te: 8/30/2019
Contact Name Comment	: JON MORROW	vv	A 99202	Project Name: STR CAT	EET SWEEPING VS CH BASIN
Sample #: 19083	0023-001 Customer Sample #	: 082	819CBS1 CS		
Recv'd: 🖌 N	latrix: Solid Collecto	r: GOI	RDON CRANE	Date Collected: 8/2	9/2019
Quantity: 1	Date Received: 8/30/2019	10:45:0	0 AM	Time Collected: 8:3	0 AM
Comment:					
Test		Lab	Method	Due Date	Priority
% SOLIDS		S	% solids	9/11/2019	Normal (~10 Days)
%Moisture		S	%moisture	9/11/2019	<u>Normal (~10 Days)</u>
Sample #: 19083	0023-002 Customer Sample #	: 082	2819CBS2 CS		
Recv'd: 🔽 N	latrix: Solid Collecto	r GO		Date Collected: 8/2	0/2010
<u> </u>					5/2015
Quantity: 1	Date Received: 8/30/2019	10:45:0	0 AM	Time Collected: 8:3	0 AM
Quantity: 1 Comment:	Date Received: 8/30/2019	10:45:0	0 AM	Time Collected: 8:3	0 AM
Quantity: 1 Comment: Test	Date Received: 8/30/2019	10:45:0	0 AM	Time Collected: 8:3	0 AM Priority
Quantity: 1 Comment: Test % SOLIDS	Date Received: 8/30/2019	10:45:00	0 AM Method % solids	Time Collected: 8:3 Due Date 9/11/2019	0 AM Priority Normal (~10 Days)
Quantity: 1 Comment: Test % SOLIDS %Moisture	Date Received: 8/30/2019	Lab S	0 AM Method % solids %moisture	Time Collected: 8:3 Due Date 9/11/2019 9/11/2019 9/11/2019	0 AM Priority <u>Normal (~10 Days)</u> Normal (~10 Days)
Quantity: 1 Comment: Test % SOLIDS %Moisture Sample #: 190830	Date Received: 8/30/2019	Lab S S	Method % solids %moisture	Time Collected: 8:3 Due Date 9/11/2019 9/11/2019 9/11/2019	0 AM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
Quantity: 1 Comment: Test % SOLIDS %Moisture Sample #: 190830	Date Received: 8/30/2019	Lab S S 082	Method % solids % moisture 2819CBS3 CS	Time Collected: 8:3 Due Date 9/11/2019 9/11/2019 9/11/2019	0 AM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>
Quantity: 1 Comment: 1 Test % SOLIDS %Moisture Sample #: 190830 Recv'd: V M	Date Received: 8/30/2019 0023-003 Customer Sample # latrix: Solid Collecto	Lab S S r: 082	Method % solids %moisture 2819CBS3 CS RDON CRANE	Time Collected: 8:3 Due Date 9/11/2019 9/11/2019 9/11/2019 Date Collected: 8/2 Time Collected: 8/2	9/2019 0 AM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 9/2019
Quantity: 1 Comment:	Date Received: 8/30/2019 Date Received: 8/30/2019 D023-003 Customer Sample # latrix: Solid Collecto Date Received: 8/30/2019	Lab S S r: 082 r: GOI 10:45:00	Method % solids %moisture 2819CBS3 CS RDON CRANE 0 AM	Time Collected: 8:3 Due Date 9/11/2019 9/11/2019 9/11/2019 9/11/2019 8/2 Date Collected: 8/2 Time Collected: 8/3	0 AM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 9/2019 0 AM
Quantity: 1 Comment: 1 Test 1 % SOLIDS 1 %Moisture 1 Sample #: 190830 Recv'd: ✓ M Quantity: 1 1 Comment: 1 1	Date Received: 8/30/2019 Doccorrection 20023-003 Customer Sample # latrix: Solid Collecto Date Received: 8/30/2019	Lab S S r: 082 r: GOI 10:45:00	Method % solids %moisture 2819CBS3 CS RDON CRANE 0 AM	Time Collected: 8:3 Due Date 9/11/2019 9/11/2019 9/11/2019 Date Collected: 8/2 Time Collected: 8/2	9/2019 0 AM Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u> 9/2019 0 AM
Quantity: 1 Comment: 1 Test 1 % SOLIDS 1 %Moisture 1 Sample #: 190834 Recv'd: ✓ M Quantity: 1 1 Comment: 1 1 Test ✓ M	Date Received: 8/30/2019 Doc23-003 Customer Sample # latrix: Solid Collecto Date Received: 8/30/2019	Lab S S : 082 r: GOI 10:45:00	0 AM Method % solids %moisture 2819CBS3 CS RDON CRANE 0 AM Method	Time Collected: 8:3 Due Date 9/11/2019 9/11/2019 9/11/2019 Date Collected: 8/2 Time Collected: 8/3 Due Date 8/3	0 AM
Quantity: 1 Comment: Test % SOLIDS %Moisture Sample #: 190830 Recv'd: ✓ M Quantity: 1 Comment: Test % SOLIDS	Date Received: 8/30/2019 Doccorrection 20023-003 Customer Sample # latrix: Solid Collector Date Received: 8/30/2019	Lab S S : 082 r: GOI 10:45:00 Lab S	Method % solids %moisture 2819CBS3 CS RDON CRANE 0 AM Method % solids	Time Collected: 8:3 Due Date 9/11/2019 9/11/2019 9/11/2019 Date Collected: 8/2 Time Collected: 8/3 Due Date 9/3 9/11/2019 9/3	0 AM Priority <u>Normal (~10 Days)</u> Normal (~10 Days) 9/2019 0 AM Priority <u>Normal (~10 Days)</u>

Customer	Name:	CITY C	OF ELLEN	ISBURG				Ord	er II	D: 190830023
		1401 E	TRENT	AVE, SUIT	E 101			Order	Date	e: 8/30/2019
		SPOKA	ANE		WA	A 992	202			
Contact	Name [.]	JON M	ORROW					Project Name:	STRE	ET SWEEPING VS
Com		001111						(CATC	CH BASIN
Con	nment:									
• • <i>"</i>	400000		• •	<u> </u>	r					
Sample #:	1908300	023-004	Customer	Sample #:	0828	319CBS4 CS				
Recv'd:	✔ Ma	trix: Soli	id	Collector:	GOR	RDON CRANE		Date Collected:	8/29/	/2019
Quantity:	1	Date Re	eceived:	8/30/2019 10):45:00) AM		Time Collected:	8:30	AM
Comment:										
Test				L	ab	Method		Due Date		Priority
% SOLIDS				S		% solids		9/11/2019		<u>Normal (~10 Days)</u>
%Moisture				S		%moisture		9/11/2019		<u>Normal (~10 Days)</u>
Sample #:	1908300)23-005	Customer	Sample #:	0828	819CBS5 TS				
Recv'd-	Ma	trix: Soli	id	Collector:	GOR			Date Collected	8/29	/2019
Quantity:	1	Date Re	eceived:	8/30/2019 10):45:00) AM		Time Collected:	8:30	AM
Comment:										
••••••••										
Test				L	ab	Method		Due Date		Priority
% SOLIDS				S	;	% solids		9/11/2019		<u>Normal (~10 Days)</u>
%Moisture				S	;	%moisture		9/11/2019		<u>Normal (~10 Days)</u>
Sample #:	1908300)23-006	Customer	Sample #:	0829	RIOCESE TS				
		20 000	•••••		0020	019000010				
Recv'd:	Ma	trix: Soli	id	Collector:	GOF	RDON CRANE		Date Collected:	8/29/	/2019
Quantity:	1	Date Re	eceived:	8/30/2019 10	0:45:00	AM		Time Collected:	8:30	AM
Comment:										
Test					ah	Method		Due Date		Priority
% SOLIDS						% solids		9/11/2019		Normal (~10 Dave)
%Moisture				S	;	%moisture		9/11/2019		<u>Normal (~10 Days)</u>
,										<u>Horman (* 10 Days)</u>
Sample #:	1908300	023-007	Customer	Sample #:	0828	19CBS7 TS				
Recv'd:	✓ Ma	trix: Soli	id	Collector:	GOR	NDON CRANE		Date Collected:	8/29/	/2019
Quantity:	1	Date Re	eceived:	8/30/2019 10):45:00	AM		Time Collected:	8:30	AM
Comment:										
Test				L	ab	Method		Due Date		Priority
% SOLIDS				S	i	% solids		9/11/2019		<u>Normal (~10 Days)</u>
%Moisture				S	i	%moisture		9/11/2019		<u>Normal (~10 Days)</u>

Order ID:

1401 E TRENT AVE, SUITE 101 SPOKANE WA

99202

Contact Name: JON MORROW

Project Name: STREET SWEEPING VS CATCH BASIN

Order Date:

Comment:

SAMPLE CONDITION RECORD

Samples received in a cooler?	No
Samples received intact?	Yes
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Labels and chain agree?	Yes
Total number of containers?	7

190830023

8/30/2019

Sample Extraction Logbook

%Moisture instructions: Determine the percent moisture for each solid sample by oven drying about 10.0g of sample at 105°C for 2 hours. Allow to cool in a dessicator and re-weigh. Oven dry for an additional 30 minutes and re-weigh. Further drying is necessary if the two weighings differ by more than 1%.

	Dish	Dish wt	Dish +	Dry 1	Dry 2	%					1		
Lab Sample ID	ID	(g)	wet (g)	(g)	(g)	moisture	Sample	Weight	(g)	Method	Balance	Date/Time	Initials
190830023-00		0.276	0.9	0.8	0.8	16				Yom	BWW	9-19-19	ARUI
002	2	0.278	0.55	0.4	0.4	55.1				I	1		1
003	- 3	6.272	1.55	0.65	0.65	.704						<u>+</u>	
Ч	Y	0.276	0.9	0.65	0.105	40.1							+
5	5	0.172	0.8	0.65	0.65	243						1	
6	6	0.276	1.3	0.8	0.8	488						+	++-1
7	7	0.176	6.95	0.8	0.8	19.4							
					K								
			CT SHE REAL OF 18	BBBBCARCON									+
					Result	s are in k	a. not			/			+
					g		3 ,						
				9 - 0 25 3			b =		~				
			1.00	i kana									
				ninet elegation des ele		/				¢			
							1						
							+						
					-								

Comments:



Chain of Custody Record

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 504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433

' 90830 023 CELL Last 9/11/2019

1st SAMP 8/29/2019 1st RCVD 8/30/2019

STREET SWEEPING VS CATCH

Comp	any Name:	City of Ellensburg	J	Proje	ect Mar	nager	:			Jon M	orrow			
Addre	ss: 50	01 N Anderson St.		Proje	ect Nar	ne &	#:	Stre	et S	weeping	y vs C	atch	Basin	http://www.anateklabs.com/services/guidelines/reporting.asp
City:	Ellensburg	State: WA Zip:	98926	Emai	il Addr	ess :		mor	rowj(@ci.elle	nsbur	g.wa.	us	Normal *All rush orderPhone Mail
Phone	a:	(509) 929-3844		Purc	hase C)rder f	#:							2nd Day* prior approvedFax
Fax:				Sam	pler Na	ame 8	, phor	ie: (Gord	on Crar	ne 509	962	-7236	☐Other*⊏maii
	Provide S	ample Description					Lis	t Ana	lyses	s Requ	ested		Sec.	Note Special Instructions/Comments
	Sediment o	collected in filter socks		Containers	ple Volume	y Weight	ASTM D422							 Please send a copy of the results to Aimee Navickis-Brasch (aimeen@osbornconsulting.com) & Jon
Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of (Sam	5	PSD							at email above
	082819CBS1 CS	08/29/19 8:30 AM	solid			×								SWBS
	082819CBS2 CS	08/29/19 8:30 AM	solid			×								
	082819CBS3 CS	08/29/19 8:30 AM	solid			×								
1	082819CBS4 CS	08/29/19 8:30 AM	solid			×		\square				\square		
	082819CBS5 TS	08/29/19 8:30 AM	solid			×								
	082819CBS6 TS	08/29/19 8:30 AM	solid			×								
() ()	082819CBS7 TS	08/29/19 8:30 AM	solid			×								
														Inspection Checklist
														Received Intact? N
														Labels & Chains Agree?
Sec.														Containers Sealed? (V) N
Constanting of the														VOC Head Space?
and and														npc/s /s
Sec.	Prin	ted Name	Signature /	1	2			Com	pany	AC MARK	Date		Time	UPXAC/ni
Relin	nquished by	ordon Crane	honly	10	ra	inf		Ca	in of	Eburg	8-2	9-19	11:11	Temperature (°C):
Rece	aived by	Jendy Pr	M	en	de	Ste	V	A	MA	till	8/7	30/19	1045	Preservative:
Relin	nquished by	900			0	6)				/		, ,	
Rece	eived by										\perp			Date & Time: 8-30-19 1045
Relir	nquished by										<u> </u>			Inspected By: M/12
Rece	eived by		1											0

October 2019 Data Collection Event

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	CITY OF ELLENSBURG	Batch #:	191108057
Address:	501 N ANDERSON ST	Project Name:	STREET SWEEPING VS
	ELLENSBURG, WA 99892		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	191108057-001 10302019CBTS1 Solid]	Sampling Date Sampling Time Sample Locatior	11/5/2019 3:05 PM	Date/Time Received Extraction Date		11/8/2019	2:17 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS %moisture		22.9 54.1	% %	0.01	11/12/2019 2:00:00 PM 11/12/2019	NDE NDE	SM2540E %moisture	

Sample Number Client Sample ID Matrix Comments	191108057-002 10302019CBTS2 Solid]	Sampling Date Sampling Time Sample Locatior	11/5/2019 3:05 PM	Date/Ti Extract	me Received ion Date	11/8/2019	2:17 PM
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS %moisture		33.7 63.6	% %	0.01	11/12/2019 2:00:00 PM 11/12/2019	NDE NDE	SM2540E %moisture	

Sample Number Client Sample ID Matrix Comments	191108057-003 10302019CBTS3 Solid		Sampling Date Sampling Time Sample Locatior	11/5/2019 Date/Time Received 3:05 PM Extraction Date on Image: Construction Date		11/8/2019	2:17 PM	
Parameter	F	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS		20.6	%	0.01	11/12/2019 2:00:00 PM	NDE	SM2540E	
%moisture		50.2	%		11/12/2019	NDE	%moisture	

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Client:	CITY OF ELLENSBURG	Batch #:	191108057
Address:	501 N ANDERSON ST	Project Name:	STREET SWEEPING VS
	ELLENSBURG, WA 99892		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	Sample Number191108057-004Client Sample IDCOMPOSITE: CBTS 1,2,3MatrixSolidComments		11/5/2019	Date/Tir Extracti	ne Received on Date	11/8/2019	2:17 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids	48.0	%	0.1	11/12/2019 11:00:00 AM	NDE	% solids	
%moisture	52	%		11/12/2019	NDE	%moisture	

Sample Number Client Sample ID Matrix Comments	191108057-005 10302019CBCS1 Solid]	Sampling Date Sampling Time Sample Locatior	11/5/2019Date/Time Received3:20 PMExtraction Date		11/8/2019	2:17 PM	
Parameter		Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS		15.2	%	0.01	11/12/2019 2:00:00 PM	NDE	SM2540E	
%moisture		42.5	%		11/12/2019	NDE	%moisture	

Sample Number191108057-006Client Sample ID10302019CBCS2MatrixSolidComments			Sampling Date Sampling Time Sample Locatior	11/5/2019 3:20 PM	Date/Ti Extract	11/8/2019	2:17 PM	
Parameter	R	esult	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS %moisture	2	25.7 56.7	% %	0.01	11/12/2019 2:00:00 PM 11/12/2019	NDE NDE	SM2540E %moisture	

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Client:	CITY OF ELLENSBURG	Batch #:	191108057
Address:	501 N ANDERSON ST	Project Name:	STREET SWEEPING VS
	ELLENSBURG, WA 99892		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	ample Number 191108057-007 ilient Sample ID 10302019CBCS3 latrix Solid comments Solid		11/5/2019 3:20 PM 1	Date/Tir Extracti	ne Received on Date	11/8/2019	2:17 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS %moisture	20.2 47.5	% %	0.01	11/12/2019 2:00:00 PM 11/12/2019	NDE NDE	SM2540E %moisture	

Sample Number Client Sample ID Matrix Comments	191108057-008 COMPOSITE: CBCS 1,2,3 Solid	Sampling Date Sampling Time Sample Location	11/5/2019	Date/Time Received Extraction Date		11/8/2019	2:17 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture	52.6 47.4	% %	0.1	11/12/2019 11:00:00 AM 11/12/2019	NDE NDE	% solids %moisture	

Sample Number Client Sample ID Matrix Comments	191108057-009 10302019SSTS1 Solid	S S S	Campling Date Campling Time Cample Location	11/5/2019 3:25 PM	Date/Ti Extract	me Received ion Date	11/8/2019	2:17 PM
Parameter	Re	esult	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS	3	3.10	%	0.01	11/12/2019 2:00:00 PM	NDE	SM2540E	
%moisture		4.1	%		11/12/2019	NDE	%moisture	

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Client: Address:	CITY OF ELLENSBURG Address: 501 N ANDERSON ST ELLENSBURG, WA 99892 Attn: ION MORROW/			Batch #: Project Name:	191108057 STREET SWEEPING VS CATCH BASIN							
Attn:	JON MORROW											
	Analytical Results Report											
Sample Number Client Sample ID Matrix	191108057-010 10302019SSTS2 Solid	Sampling Date Sampling Time Sample Locatior	11/5/2019 3:25 PM 1	Date/T Extrac	ime Received	11/8/2019	2:17 PM					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS	2.90	%	0.01	11/12/2019 2:00:00 PM	NDE	SM2540E	
%moisture	4	%		11/12/2019	NDE	%moisture	

Sample Number Client Sample ID Matrix Comments	191108057-011 10302019SSTS3 Solid		Sampling Date Sampling Time Sample Location	11/5/2019 3:25 PM	Date/Ti Extracti	ne Received ion Date	11/8/2019	2:17 PM
Parameter	R	esult	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS		4.30	%	0.01	11/12/2019 2:00:00 PM	NDE	SM2540E	
%moisture		4.2	%		11/12/2019	NDE	%moisture	

Sample Number Client Sample ID Matrix Comments	Imple Number 191108057-012 Sampling Date 11/5/2019 Date Int Sample ID COMPOSITE: SSTS 1,2,3 Sampling Time Ext rix Solid Sample Location Imments Sample Location Sample Location		Date/Tir Extracti	ne Received on Date	11/8/2019	2:17 PM	
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids	96.4	%	0.1	11/12/2019 11:00:00 AM	NDE	% solids	
%moisture	3.6	%		11/12/2019	NDE	%moisture	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Comments

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Client: Address:	CITY OF ELLENSBURG 501 N ANDERSON ST	Batch #: Project Name:	191108057 STREET SWEEPING VS
	ELLENSBURG, WA 99892		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	191108057-013 10302019SSCS1 Solid]	Sampling Date Sampling Time Sample Locatior	11/5/2019 3:35 PM	1/5/2019Date/Time Received:35 PMExtraction Date		11/8/2019	2:17 PM
Parameter TVS %moisture		Result 5.70 17.6	Units %	PQL 0.01	Analysis Date 11/12/2019 2:00:00 PM 11/12/2019	Analyst NDE NDF	Method SM2540E %moisture	Qualifier

Sample Number Client Sample ID Matrix Comments	191108057-014 10302019SSCS2 Solid	Sampling Date Sampling Time Sample Locatior	11/5/2019 3:35 PM	Date/Tir Extract	me Received ion Date	11/8/2019	2:17 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS	8.20	%	0.01	11/12/2019 2:00:00 PM	NDE	SM2540E	
%moisture	23.4	%		11/12/2019	NDE	%moisture	

Sample Number Client Sample ID Matrix Comments	191108057-015 10302019SSCS3 Solid	Sampling Date Sampling Time Sample Location	11/5/2019 3:35 PM n	Date/Tii Extracti	me Received ion Date	11/8/2019	2:17 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
TVS	5.00	%	0.01	11/12/2019 2:00:00 PM	NDE	SM2540E	
%moisture	17.4	%		11/12/2019	NDE	%moisture	

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Client:	CITY OF ELLENSBURG	Batch #:	191108057
Address:	501 N ANDERSON ST	Project Name:	STREET SWEEPING VS
	ELLENSBURG, WA 99892		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	191108057-016 COMPOSITE: SSCS 1,2,3 Solid	Sampling Date Sampling Time Sample Location	11/5/2019	Date/Tir Extracti	ne Received on Date	11/8/2019	2:17 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids	81.9	%	0.1	11/12/2019 11:00:00 AM	NDE	% solids	
%moisture	18.1	%		11/12/2019	NDE	%moisture	

Authorized Signature

Kathleen ()

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated. Soil/solid results are reported on a dry-weight basis unless otherwise noted.

LABORATORY SUMMARY									
LABORATORY NUMBER	R			19-1157	19-1158	19-1159	19-1160	19-1161	19-1162
SAMPLED BY				Client	Client	Client	Client	Client	Client
SAMPLE TYPE				Bulk	Bulk	Bulk	Bulk	Bulk	Bulk
DATE RECEIVED				12/2/19	12/2/19	12/2/19	12/2/19	12/2/19	12/2/19
FIELD SAMPLE ID				1911108057-004	1911108057-008	1911108057-012	1911108057-016	1911108055-008	1911108055-009
				103019CBTS	103019CBCS	103019SSTS	103019SSCS	103019CBS	103019CBS
			Test					CS	TS
		Units	Method						
SIEVE ANALYSIS		0 (ASIM D422						
S	1"	%							
1	3/4"	_							
Е	1/2"	Р							
V	3/8"	А		100	100	100	100		100
E	1/4"	S		88	78	85	77	100	86
	#10	S		67	46	65	53	73	73
S	#16	Ι		59	29	56	44	71	71
Ι	#30	Ν		45	14	46	32	69	67
Z	#40	G		22	9	42	25	68	66
Е	#100			12	3	27	12	66	61
	#200			8.2	1.9	16	8.6	65	57
	0.05mm			8.0	1.4	9.5	8.1	62	50
	0.01mm			7.8	0.9	7.6	6.0	45	29
	0.005mm			6.6	0.0	5.1	3.0	31	18
	0.001mm			3.3	0.0	2.4	0.0	8.5	8.1

SOILS LABORATORY SUMMARY

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com 504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Login Report Customer Name: CITY OF ELLENSBURG Order ID: 191108057 501 N ANDERSON ST Order Date: 11/8/2019 **ELLENSBURG** WA 99892 Project Name: STREET SWEEPING VS Contact Name: JON MORROW CATCH BASIN Comment: PSD SUB TO BUDINGER 191108057-001 Sample #: Customer Sample #: 10302019CBTS1 Matrix: Solid Collector: GORDON CRANE 11/5/2019 Recv'd: Date Collected: \checkmark 11/8/2019 2:17:00 PM Quantity: 1 **Date Received: Time Collected:** 3:05 PM Comment: Test Lab Method Due Date Priority %Moisture S %moisture 11/20/2019 Normal (~10 Days) SOLIDS - TVS S SM2540E 11/20/2019 Normal (~10 Days) Sample #: 191108057-002 Customer Sample #: 10302019CBTS2 Recv'd: **V** Matrix: Solid Collector: GORDON CRANE **Date Collected:** 11/5/2019 Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Time Collected: 3:05 PM Comment: Test Lab Method **Due Date** Priority %Moisture S %moisture 11/20/2019 Normal (~10 Days) SOLIDS - TVS S SM2540E 11/20/2019 Normal (~10 Days) 191108057-003 Sample #: Customer Sample #: 10302019CBTS3 Matrix: Solid GORDON CRANE **Date Collected:** 11/5/2019 Recv'd: Collector: \checkmark 11/8/2019 2:17:00 PM **Time Collected:** Quantity: 1 Date Received: 3:05 PM Comment: Test Lab Method Due Date Priority %Moisture s %moisture 11/20/2019 Normal (~10 Days) SOLIDS - TVS S SM2540E 11/20/2019 Normal (~10 Days) Sample #: 191108057-004 Customer Sample #: COMPOSITE: CBTS 1,2,3 Recv'd: Matrix: Solid Collector: GORDON CRANE Date Collected: 11/5/2019 ~ **Time Collected:** Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Comment: Due Date Method Priority Test Lab % SOLIDS S % solids 11/20/2019 Normal (~10 Days) S %Moisture 11/20/2019 %moisture Normal (~10 Days)
Customer Name: CITY OF ELLENSB	SURG	Order ID: 191108057
501 N ANDERSON	ST	Order Date: 11/8/2019
ELLENSBURG	WA 99892	
Contact Name: JON MORROW		Project Name: STREET SWEEPING VS
Comment: PSD SUB TO BUDI	INGER	CATCH BASIN
Sample #: 191108057-005 Customer Sam	mple #: 10302019CBCS1	
Recv'd: 🔽 Matrix: Solid 🛛 📿	ollector: GORDON CRANE	Date Collected: 11/5/2019
Quantity: 1 Date Received: 11/	8/2019 2:17:00 PM	Time Collected: 3:20 PM
Comment:		
Test	Lab Method	Due Date Priority
%Moisture	S %moisture	11/20/2019 <u>Normal (~10 Days)</u>
SOLIDS - TVS	S SM2540E	11/20/2019 <u>Normal (~10 Days)</u>
Sample #: 191108057-006 Customer Sam	mple #: 10302019CBCS2	
Recv'd: 🖌 Matrix: Solid Co	ollector: GORDON CRANE	Date Collected: 11/5/2019
Quantity: 1 Date Received: 11/	/8/2019 2:17:00 PM	Time Collected: 3:20 PM
Comment:		
Tast	Lab Mathad	
Moisture	S %moisture	11/20/2019 Normal (10 Days)
SOLIDS - TVS	S SM2540E	11/20/2019 Normal (~10 Days)
Sample #: 191108057-007 Customer Sar	mple #: 10302019CBCS3	
Recv'd: 🖌 Matrix: Solid Co	ollector: GORDON CRANE	Date Collected: 11/5/2019
Recv'd:Image: Matrix: SolidColorQuantity:1Date Received:11/2	ollector: GORDON CRANE 8/2019 2:17:00 PM	Date Collected: 11/5/2019 Time Collected: 3:20 PM
Recv'd:Image: Matrix: SolidCompare Compare C	ollector: GORDON CRANE 8/2019 2:17:00 PM	Date Collected:11/5/2019Time Collected:3:20 PM
Recv'd: V Matrix: Solid Co Quantity: 1 Date Received: 11/ Comment:	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method	Date Collected:11/5/2019Time Collected:3:20 PMDue DatePriority
Recv'd: ✓ Matrix: Solid Categories Quantity: 1 Date Received: 11/2 Comment:	ollector: GORDON CRANE /8/2019 2:17:00 PM Lab Method S %moisture	Date Collected: 11/5/2019 Time Collected: 3:20 PM Due Date Priority 11/20/2019 Normal (~10 Days)
Recv'd: ✓ Matrix: Solid Categorie Quantity: 1 Date Received: 11/2 Comment: 7 1 1 Yest 9 1 1 SOLIDS - TVS 1 1 1	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S %moisture S SM2540E	Date Collected: 11/5/2019 Time Collected: 3:20 PM Due Date Priority 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days)
Recv'd: Matrix: Solid Cate Quantity: 1 Date Received: 11/2 Comment: Test 1 1 %Moisture SOLIDS - TVS 1 1 Sample #: 191108057-008 Customer Same	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S %moisture S SM2540E mple #: COMPOSITE: CBCS 1,2,3	Date Collected: 11/5/2019 Time Collected: 3:20 PM Due Date Priority 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days)
Recv'd: Matrix: Solid Common Quantity: 1 Date Received: 11/2 Comment: 1 1 1 Test % 1 1 SOLIDS - TVS 1 1 1 Sample #: 191108057-008 Customer Same Recv'd: Image: Matrix: Solid Commer Same	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S %moisture S SM2540E mple #: COMPOSITE: CBCS 1,2,3 ollector: GORDON CRANE	Date Collected: 11/5/2019 Time Collected: 3:20 PM Due Date Priority 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days) 3 Date Collected: 11/5/2019 Normal (~10 Days)
Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11/2 Comment:	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S %moisture S SM2540E mple #: COMPOSITE: CBCS 1,2,3 ollector: GORDON CRANE 18/2019 2:17:00 PM	Date Collected: 11/5/2019 Time Collected: 3:20 PM Due Date Priority 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days) 3 Date Collected: 11/5/2019 11/5/2019
Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment: 1 Date Received: 11// Test % 1 1 %Moisture SOLIDS - TVS 1 1 Sample #: 191108057-008 Customer Same Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment: 1 1 1 1	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S %moisture S SM2540E mple #: COMPOSITE: CBCS 1,2,3 ollector: GORDON CRANE 8/2019 2:17:00 PM	Date Collected: 11/5/2019 Time Collected: 3:20 PM Due Date Priority 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days) 11/20/2019 Time Collected: 11/5/2019 11/5/2019
Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment:	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S %moisture S SM2540E mple #: COMPOSITE: CBCS 1,2,3 ollector: GORDON CRANE 8/2019 2:17:00 PM	Date Collected:11/5/2019Time Collected:3:20 PMDue DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)3Date Collected:11/5/201911/5/2019
Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment: 1 1 1 Test % 1 1 SOLIDS - TVS 1 1 1 Sample #: 191108057-008 Customer Same Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment: Test 1 1 1	bilector: GORDON CRANE (8/2019 2:17:00 PM Lab Method S %moisture S SM2540E mple #: COMPOSITE: CBCS 1,2,3 bilector: GORDON CRANE (8/2019 2:17:00 PM Lab Method	Date Collected: 11/5/2019 Time Collected: 3:20 PM Due Date Priority 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days) 3 Date Collected: 11/5/2019 Due Date Priority Bue Date Priority
Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment: 1 1 11// Test % 1 1 %Moisture SOLIDS - TVS 1 1 Sample #: 191108057-008 Customer Same 1 Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment: 1 1 1 1 Yest % 5 5 5	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S %moisture S SM2540E mple #: COMPOSITE: CBCS 1,2,3 ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S % solids	Date Collected:11/5/2019Time Collected:3:20 PMDue DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)3Date Collected:11/5/2019PriorityTime Collected:Priority11/20/2019Priority11/20/2019Normal (~10 Days)
Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment: 1 1 1 Test % 1 1 %Moisture SOLIDS - TVS 1 1 Sample #: 191108057-008 Customer Same Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment: 1 Test 1 % SOLIDS % % 1	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S %moisture S SM2540E mple #: COMPOSITE: CBCS 1,2,3 ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S % solids S %moisture	Date Collected:11/5/2019Time Collected:3:20 PMDue DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)3Date Collected:Due DatePriorityTime Collected:11/5/2019Due DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)
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Recv'd: ✓ Matrix: Solid Cate Quantity: 1 Date Received: 11// Comment:	ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S %moisture S SM2540E mple #: COMPOSITE: CBCS 1,2,3 ollector: GORDON CRANE 8/2019 2:17:00 PM Lab Method S % solids S % moisture mple #: 10302019SSTS1 ollector: GORDON CRANE 8/2019 2:17:00 PM Method Lab Method S % solids S % collage Mathod S Mathod S GORDON CRANE % solids Mathod S Mathod S S % collage S % collage Mathod S Mathod S Mathod S Mathod S Mathod S	Date Collected: 11/5/2019 Time Collected: 3:20 PM Due Date Priority 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days) Normal (~10 Days) Normal (~10 Days) Mate Collected: 11/5/2019 Time Collected: 11/20/2019 Normal (~10 Days) 11/20/2019 Mormal (~10 Days) 11/20/2019 Mormal (~10 Days) Normal (~10 Days) Time Collected: 11/5/2019 Date Collected: 11/5/2019 Date Collected: 3:25 PM
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Customer Name. Of FOF ELLENGBORG	Order ID: 191108057
501 N ANDERSON ST	Order Date: 11/8/2019
ELLENSBURG WA 99892	
Contact Name: JON MORROW	Project Name: STREET SWEEPING VS
Comment: PSD SUB TO BUDINGER	CATCH BASIN
Sample #: 191108057-010 Customer Sample #: 10302019SSTS2	
Recv'd: Matrix: Solid Collector: GORDON CRANE	Date Collected: 11/5/2019
Quantity: 1 Date Received: 11/8/2019 2:17:00 PM	Time Collected: 3:25 PM
Comment:	
Test Lab Method	Due Date Priority
%Moisture S %moisture	11/20/2019 <u>Normal (~10 Days)</u>
SOLIDS - TVS S SM2540E	11/20/2019 <u>Normal (~10 Days)</u>
Sample #: 191108057-011 Customer Sample #: 10302019SSTS3	
Recv'd: Matrix: Solid Collector: GORDON CRANE	Date Collected: 11/5/2019
Quantity: 1 Date Received: 11/8/2019 2:17:00 PM	Time Collected: 3:25 PM
Comment:	
Test Lab Method	Due Date Priority
%Moisture S %moisture	11/20/2019 <u>Normal (~10 Days)</u>
SOLIDS - TVS S SM2540E	11/20/2019 <u>Normal (~10 Days)</u>
Sample #: 191108057-012 Customer Sample #: COMPOSITE: SSTS 1,2,	3
Recv'd: Antrix: Solid Collector: GORDON CRANE	Date Collected: 11/5/2019
Recv'd: Matrix: Solid Collector: GORDON CRANE Quantity: 1 Date Received: 11/8/2019 2:17:00 PM	Date Collected: 11/5/2019 Time Collected:
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Recv'd: Matrix: Solid Collector: GORDON CRANE Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Comment: Lab Method % SOLIDS S % solids %Moisture S % moisture	Date Collected: 11/5/2019 Time Collected: Priority Due Date Priority 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days)
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Recv'd: ✓ Matrix: Solid Collector: GORDON CRANE Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Comment: Lab Method % SOLIDS S % solids %Moisture S % moisture Sample #: 191108057-013 Customer Sample #: 10302019SSCS1 Recv'd: ✓ Matrix: Solid Collector: GORDON CRANE	Date Collected: 11/5/2019 Time Collected: Priority 11/20/2019 Normal (~10 Days) 11/20/2019 Normal (~10 Days) Date Collected: 11/5/2019
Recv'd: ✓ Matrix: Solid Collector: GORDON CRANE Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Comment: Image: Constant of the second of the seco	Date Collected:11/5/2019Time Collected:PriorityDue DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)Date Collected:11/5/2019Time Collected:3:35 PM
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Recv'd:✓Matrix: SolidCollector:GORDON CRANEQuantity:1Date Received:11/8/2019 2:17:00 PMComment:TestLabMethod% SOLIDSS% solids% MoistureS% moistureSample #:191108057-013Customer Sample #:10302019SSCS1Recv'd:✓Matrix:SolidCollector:GORDON CRANEQuantity:1Date Received:11/8/2019 2:17:00 PMComment:LabMethod%MoistureS%moistureSoLIDS - TVSSSM2540ESample #:191108057-014Customer Sample #:10302019SSCS2	Date Collected:11/5/2019Time Collected:PriorityDue DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)Date Collected:11/5/2019Time Collected:3:35 PMDue DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)
Recv'd: ✓ Matrix: Solid Collector: GORDON CRANE Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Comment: Lab Method % SOLIDS S % solids % SOLIDS S % solids % SOLIDS S % solids % Moisture S % moisture Sample #: 191108057-013 Customer Sample #: 10302019SSCS1 Recv'd: ✓ Matrix: Solid Collector: GORDON CRANE Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Comment: Test Lab Method Moisture S %Moisture S %moisture S %moisture SOLIDS - TVS S SM2540E SM2540E Sample #: 191108057-014 Customer Sample #: 10302019SSCS2 Recv'd: ✓ Matrix: Solid Collector: GORDON CRANE	Date Collected:11/5/2019Time Collected:Priority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)Date Collected:11/5/2019Time Collected:3:35 PMDue DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)Due DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)Date Collected:11/5/2019
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Recv'd: ✓ Matrix: Solid Collector: GORDON CRANE Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Comment: Lab Method * SOLIDS S % solids % SOLIDS S % solids % %Moisture S % moisture Sample #: 191108057-013 Customer Sample #: 10302019SSCS1 Recv'd: ✓ Matrix: Solid Collector: GORDON CRANE Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Comment: Test Lab Method % Moisture SoLIDS - TVS S SM2540E SM2540E Sample #: 191108057-014 Customer Sample #: 10302019SSCS2 Recv'd: ✓ Matrix: Solid Collector: GORDON CRANE Quantity: 1 Date Received: 11/8/2019 2:17:00 PM Comment: Test Lab Method Method Matrix:	Date Collected:11/5/2019Time Collected:Priority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)Date Collected:11/5/2019Time Collected:3:35 PMDue DatePriority11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)11/20/2019Normal (~10 Days)Date Collected:11/5/2019Time Collected:3:35 PM
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Customer Name: CITY OF ELLENSBUR	G		Order I	D: 191108057						
501 N ANDERSON ST			Order Date	e: 11/8/2019						
ELLENSBURG	W	A 99892								
Contact Name: JON MORROW			Project Name: STRE	ET SWEEPING VS						
Comment: PSD SUB TO BUDING	ER		CATC	CH BASIN						
SOLIDS - TVS	S	SM2540E	11/20/2019	<u>Normal (~10 Days)</u>						
Sample #: 191108057-015 Customer Sample	#: 10302	2019SSCS3								
Recv'd: 🖌 Matrix: Solid Collect	tor: GO	RDON CRANE	Date Collected: 11/5/	/2019						
Quantity: 1 Date Received: 11/8/20	19 2:17:00	PM	Time Collected: 3:35	PM						
Comment:										
			D D <i>i</i>	.						
	Lab	Method	Due Date	Priority						
	с С	%moisture	11/20/2019	<u>Normal (~10 Days)</u>						
	3	3102340E	11/20/2019	<u>Normai (~10 Days)</u>						
Sample #: 191108057-016 Customer Sample #: COMPOSITE: SSCS 1,2,3										
Sample #: 191108057-016 Customer Sample	e#: CO	MPUSITE: 5505 1,2,	3							
Sample #: 191108057-016 Customer Sample Recv'd: Matrix: Solid Collect	e#: CO	RDON CRANE	Date Collected: 11/5/	/2019						
Sample #:191108057-016Customer SampleRecv'd:Image: Matrix:SolidCollectQuantity:1Date Received:11/8/20	e #: COI etor: GO 19 2:17:00	RDON CRANE	Date Collected: 11/5/ Time Collected:	/2019						
Sample #: 191108057-016 Customer Sample Recv'd: Matrix: Solid Collec Quantity: 1 Date Received: 11/8/20 Comment:	s#: CO tor: GO 19 2:17:00	RDON CRANE	Date Collected: 11/5/ Time Collected:	/2019						
Sample #: 191108057-016 Customer Sample Recv'd: Matrix: Solid Collec Quantity: 1 Date Received: 11/8/20 Comment: Test	tor: GO 19 2:17:00	MPOSITE: SSCS 1,2, RDON CRANE PM Method	Date Collected: 11/5/ Time Collected:	/2019 Priority						
Sample #: 191108057-016 Customer Sample Recv'd: Matrix: Solid Collec Quantity: 1 Date Received: 11/8/20 Comment: Test % SOLIDS	ttor: GO 19 2:17:00 Lab	MPOSITE: SSCS 1,2, RDON CRANE PM <u>Method</u> % solids	Date Collected: 11/5/ Time Collected: Due Date 11/20/2019	/2019 Priority Normal (~10 Days)						
Sample #: 191108057-016 Customer Sample Recv'd: ✓ Matrix: Solid Collect Quantity: 1 Date Received: 11/8/20 Comment:	ttor: GO 19 2:17:00 Lab S S	MPOSITE: SSCS 1,2, RDON CRANE PM <u>Method</u> % solids %moisture	Date Collected: 11/5/ Time Collected: Due Date 11/20/2019 11/20/2019	/2019 Priority <u>Normal (~10 Days)</u> Normal (~10 Days)						
Sample #: 191108057-016 Customer Sample Recv'd: ✓ Matrix: Solid Collect Quantity: 1 Date Received: 11/8/20 Comment: Test SOLIDS % Moisture SAMPLI	ttor: GO 19 2:17:00 <u>Lab</u> S S E CONI	MPOSITE: SSCS 1,2, RDON CRANE PM Method % solids %moisture DITION RECO	Date Collected: 11/5/ Time Collected: Due Date 11/20/2019 11/20/2019 RD	/2019 Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>						
Sample #: 191108057-016 Customer Sample Recv'd: Matrix: Solid Collec Quantity: 1 Date Received: 11/8/20 Comment: <u>Test</u> % SOLIDS %Moisture SAMPLI Samples received in a cooler?	ttor: GO 19 2:17:00 Lab S S E CON	MPOSITE: SSCS 1,2, RDON CRANE PM <u>Method</u> % solids %moisture DITION RECO	Date Collected: 11/5/ Time Collected: Due Date 11/20/2019 11/20/2019 RD Yes	/2019 Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>						
Sample #: 191108057-016 Customer Sample Recv'd: ✓ Matrix: Solid Collect Quantity: 1 Date Received: 11/8/20 Comment: * SOLIDS % % Samples received in a cooler? Samples received intact? Samples received intact? Samples received intact?	ttor: GO 19 2:17:00 <u>Lab</u> S S E CONI	MPOSITE: SSCS 1,2, RDON CRANE PM <u>Method</u> % solids %moisture DITION RECO	Date Collected: 11/5/ Time Collected: Due Date 11/20/2019 11/20/2019 RD Yes Yes	/2019 Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>						
Sample #: 191108057-016 Customer Sample Recv'd: Matrix: Solid Collec Quantity: 1 Date Received: 11/8/20 Comment: Test % SOLIDS %Moisture Samples received in a cooler? Samples received intact? What is the temperature of the sample(s)? (• # : COI tor: GO 19 2:17:00 <u>Lab</u> S S E CON I	MPOSITE: SSCS 1,2, RDON CRANE PM <u>Method</u> % solids %moisture DITION RECO	Date Collected: 11/5/ Time Collected: 11/20/2019 11/20/2019 RD Yes Yes Yes 7.2	/2019 Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>						
Sample #: 191108057-016 Customer Sample Recv'd: ✓ Matrix: Solid Collect Quantity: 1 Date Received: 11/8/20 Comment: * SOLIDS % % SOLIDS <th< th=""></th<>	• #: COI etor: GO 19 2:17:00 <u>Lab</u> S <u>S</u> E CON I	MPOSITE: SSCS 1,2, RDON CRANE PM <u>Method</u> % solids %moisture DITION RECO	Date Collected: 11/5/ Time Collected: 11/20/2019 11/20/2019 RD Yes Yes 7.2 Yes	/2019 Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>						
Sample #: 191108057-016 Customer Sample Recv'd: ✓ Matrix: Solid Collect Quantity: 1 Date Received: 11/8/20 Comment: * SOLIDS % % SOLIDS Samples received in a cooler?	• # : COI etor: GO 19 2:17:00 <u>Lab</u> S S E CON S	MPOSITE: SSCS 1,2, RDON CRANE PM Method % solids %moisture DITION RECO	Date Collected: 11/5/ Time Collected: 11/20/ Due Date 11/20/2019 11/20/2019 RD Yes Yes Yes 7.2 Yes Yes Yes Yes	/2019 Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>						
Sample #: 191108057-016 Customer Sample Recv'd: ✓ Matrix: Solid Collect Quantity: 1 Date Received: 11/8/20 Comment: ✓ Test ✓ % SOLIDS %Moisture Samples received in a cooler? Samples received in a cooler? Samples received intact? What is the temperature of the sample(s)? (Samples received with a COC? Samples received within holding time? Are all sample bottles properly preserved?	• #: COI etor: GO 19 2:17:00 <u>Lab</u> S <u>S</u> E CON I	MPOSITE: SSCS 1,2, RDON CRANE PM <u>Method</u> % solids %moisture DITION RECO	Date Collected: 11/5/ Time Collected: 11/20/2019 11/20/2019 RD Yes Yes 7.2 Yes Yes Yes Yes Yes	/2019 Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>						
Sample #: 191108057-016 Customer Sample Recv'd: ✓ Matrix: Solid Collect Quantity: 1 Date Received: 11/8/20 Comment: ✓ Test ✓ % SOLIDS %Moisture Samples received in a cooler? Samples received in a cooler? Samples received intact? What is the temperature of the sample(s)? (Samples received with a COC? Samples received within holding time? Are all sample bottles properly preserved? Labels and chain agree? Labels and chain agree?	• # : COI etor: GO 19 2:17:00 <u>Lab</u> S S E CON I	MPOSITE: SSCS 1,2, RDON CRANE PM Method % solids %moisture DITION RECO	Date Collected: 11/5/ Time Collected: 11/20/ 11/20/2019 11/20/2019 RD Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	/2019 Priority <u>Normal (~10 Days)</u> <u>Normal (~10 Days)</u>						

Anatek
Labs,
Inc.

Chain of Custody Record

1282 Alturas Drive, Moscow ID 83843 (208) 883-2839 FAX 882-9246
 504 E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433

191108	057	CEL	Last Due	11/20/2019
1 st SAMP	11/5/2	2019 1st	RCVD	11/8/2019

STREET SWEEPING VS CATCH

Company Name	»: C	ity of Ellenshu	a a a a a a a a a a a a a a a a a a a	Proje	ect Man	ager:		(***	Jon I	Mor	row		Turn Around Time & Reporting
Address:		Rev 49026	9	Proje	Project Name & #: Stroot Sweeping vs Catch Basin				nav	Please refer to our normal turn around times at: http://www.anateklabs.com/services/quidelines/reporting.asp			
City: Spo	okane Sta	ate: WA ^{Zip:}	99208	Ema	il Addre	ess :	1	morrowj@ci.ellensburg.wa.us				a.us	Normal *All rush orderPhone Next Day* Mail
Phone:	(50	9) 995-0557		Purc	hase O	rder #	# :						
Fax:				Sam	pler Na	me &	phon	e:	Go	rdor	Crane		Other* Email
	Provide Sam	ple Description	i				List	Ana	lyses Rec	ques	ted		Note Special Instructions/Comments
Sma	catch basin ar	Jars		Containers sad	ble Volumervative:	ure Content	PSD TM D422	nic Content TM D2974					Please send a copy of the results to Jon at email above and Aimee at aimeen@osbornconsulting.com
Lab	Identification S	ampling Date/Time	Matrix	# of (Sam	Moist	AS	Orga AS					
ib Campio	10302019CBTS1	1-5-19 305	solid	1	40Z	x	×	x					For ASTM D422 testing, combine all CBTS samples, then
2 68.3	10302019CBTS2	1	solid)	1	X	x	x					combine all CBCS samples, then combine all SSTS
3 4 60	10302019CBTS3	٠٤	solid			x	×	×					samples, then combine all SSCS samples and use the
5 1	10302019CBCS1	3:20	solid			x	×	x					following sieve sizes: 1", 3/4", 1/2", 3/8", 1/4", #10, #16,
6 01 9	10302019CBCS2	211	solid			x	x	×					#30, #40, #100, #200, 0.05mm, 0.01mm, 0.005mm, and
7 8 1	10302019CBCS3	.(solid			x	X	x					0.001mm. SWBS
9	10302019SSTS1	3:25	solid			x	X	X					BUDI - PSD
10 403 1	10302019SSTS2		solid			x	X	×					Inspection Checklist
11 12	10302019SSTS3		solid			x	×	×					Received Intact? N
13 0	10302019SSCS1	3:36	solid			X	X	X					Labels & Chains Agree? 🛛 🕅 🛛 🛛
14 Lut a	10302019SSCS2	3:35	solid			x	X	×					Containers Sealed? (Y N
15 16	10302019SSCS3	3:35	solid	\checkmark	V	x	×	x					VOC Head Space? Y N
The second s	Printed	Name	Signature	1996		Recto	treach match	Con	IDANY	Ta Car	Date	Time	012/01/
Delinewiched	I finded		hord		1	4	ACT COL	G	Lafe	-	11-6-19	300	Temperature (°C): 7.2 dia 04
Relinquished b	by Clor	aur Tare	/iequ	ne l	. 1	1		4	ant to		11 7-19	117	Preservative:
Received by	NEV	ay de	MALEN	ing	1 1 2	5		-0	VNN LA	_	11-1-11	17/ /	
Relinquished b	by	/						\vdash					Date & Time: 11-7 19 1417
Received by									1111		18 10		Inspected By:
Relinquished b	ру							\vdash					inspected by. WA
Received by													

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Client:	CITY OF ELLENSBURG	Batch #:	191108055
Address:	501 N ANDERSON ST	Project Name:	STREET SWEEPING VS
	ELLENSBURG, WA 99892		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	191108055-001 10302019CBS1 CS Solid	Sampling Date Sampling Time Sample Location	10/31/2019 11:00 AM 1	Date Extra	/Time Received action Date	11/7/2019	2:17 PM
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids	20.1	%	0.1	11/11/2019	ARY	% solids	
%moisture	79.9	%		11/11/2019	ARY	%moisture	

Sample Number Client Sample ID Matrix Comments	191108055-002 10302019CBS2 CS Solid	Sampling D Sampling T Sample Loo	ate 10/31/2019 ime 11:00 AM cation	Date Extr	e/Time Received raction Date	11/7/2019	2:17 PM
Parameter	Re	sult Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids %moisture	14 8!	4.6 % 5.4 %	0.1	11/11/2019 11/11/2019	ARY ARY	% solids %moisture	

Sample Number Client Sample ID Matrix Comments	191108055-003 10302019CBS3 CS Solid	Sampling Date Sampling Time Sample Locatio	10/31/2019 • 11:00 AM on	Date, Extra	Time Received action Date	11/7/2019	2:17 PM
Parameter	Re	esult Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids	14	4.6 %	0.1	11/11/2019	ARY	% solids	
%moisture	8	5.4 %		11/11/2019	ARY	%moisture	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	CITY OF ELLENSBURG	Batch #:	191108055
Address:	501 N ANDERSON ST ELLENSBURG, WA 99892	Project Name:	STREET SWEEPING VS CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	191108055-004 10302019CBS4 CS Solid	Sampling I Sampling T Sample Lo	Date 10/31/2019 Fime 11:00 AM cation 1	Dat Exti	e/Time Received raction Date	11/7/2019	2:17 PM
Parameter	Re	esult Units	s PQL	Analysis Date	Analyst	Method	Qualifier
% solids	Ę	5.2 %	0.1	11/11/2019	ARY	% solids	
%moisture	9	4.8 %		11/11/2019	ARY	%moisture	

Sample Number Client Sample ID Matrix Comments	191108055-005 10302019CBS5 TS Solid	Sampling Date Sampling Time Sample Locatior	npling Date 10/31/2019 Date/Time Re npling Time 11:00 AM Extraction Da nple Location		/Time Received action Date	11/7/2019	2:17 PM
Parameter	Resul	t Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids	29.3	%	0.1	11/11/2019	ARY	% solids	
%moisture	70.7	%		11/11/2019	ARY	%moisture	

Sample Number191108055-006Client Sample ID10302019CBS6 TSMatrixSolidComments		Sampling Time Sample Location	11:00 AM n	Extra	ction Date		2
Parameter % solids	Re 26	esult Units	PQL 0.1	Analysis Date 11/11/2019	Analyst ARY	Method % solids	Qualifier

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	CITY OF ELLENSBURG	Batch #:	191108055
Address:	501 N ANDERSON ST	Project Name:	STREET SWEEPING VS
	ELLENSBURG, WA 99892		CATCH BASIN
Attn:	JON MORROW		

Analytical Results Report

Sample Number Client Sample ID Matrix Comments	191108055-007 10302019CBS7 TS Solid	Sampling Date Sampling Time Sample Locati	e 10/31/2019 e 11:00 AM ion	Date/ Extra	Time Received action Date	11/7/2019	2:17 PM
Parameter	Re	esult Units	PQL	Analysis Date	Analyst	Method	Qualifier
% solids	2	21.9 %	0.1	11/11/2019	ARY	% solids	
%moisture	1	/8.1 %		11/11/2019	ARY	%moisture	

Authorized Signature

Kathleen ()

Kathleen A. Sattler, Lab Manager

MCL EPA's Maximum Contaminant Level

ND Not Detected

PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory. The results reported relate only to the samples indicated. Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013; NV:ID00013; OR:ID200001-002; WA:C595 Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

Sample Extraction Logbook

%Moisture instructions: Determine the percent moisture for each solid sample by oven drying about 10.0g of sample at 105°C for 2 hours. Allow to cool in a dessicator and re-weigh. Oven dry for an additional 30 minutes and re-weigh. Further drying is necessary if the two weighings differ by more than 1%.

Lab Samale ID	Dish	Dish wt	Dish +	Dry 1	Dry 2	% moisture	% Solid	Method	Balance	Date/Time	Initials
10302019CBS1 CS	1	178	den	303	203	79.9	20.1	%m	WW Baloz	11/11/19 12:00	ARY
10302019CBS2 CS	0	172	Stro.	RUA	269	85.4	14.6				
10302019CBS3 CS	A	178	20	276	276	85.4	14.6		100		
10302019CBS4 CS	u	174	20	209	209	94.8	5.2				
10302019CBS5 TS	5	184	850	879	379	70.7	29.3				+
10302019CBS6 TS	6	180	850	357	357	08.73.6	26.4		- Logistic	1	
10302019CBS7 TS	7	174	80	322	322	78.1	219	1-1-	+	<u> </u>	4
			No.							<u> </u>	
-							1				
		877									
			J							+	
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	i Nitreau			[-			and the second second		-	
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							7.0				
		t him he Wali	1		_			670			
							a second				
						1					
/		-									

Comments:

L001.00 - Eff 22 Aug 2016

page 285 of 300

LABORATORY SUMMARY										
LABORATORY NUMBER	٤ – ا			19-1157	19-1158	19-1159	19-1160	19-1161	19-1162	
SAMPLED BY				Client	Client	Client	Client	Client	Client	
SAMPLE TYPE				Bulk	Bulk	Bulk	Bulk	Bulk	Bulk	
DATE RECEIVED				12/2/19	12/2/19	12/2/19	12/2/19	12/2/19	12/2/19	
FIELD SAMPLE ID				1911108057-004	1911108057-008	1911108057-012	1911108057-016	1911108055-008	1911108055-009	
			Test	103019CBTS	103019CBCS	103019SSTS	103019SSCS	103019CBS	103019CBS	
		Units	Method					CS	15	
SIEVE ANALYSIS			ASTM D422							
S	1"	%								
Ι	3/4"									
E	1/2"	Р								
V	3/8"	А		100	100	100	100		100	
Е	1/4"	S		88	78	85	77	100	86	
	#10	S		67	46	65	53	73	73	
S	#16	Ι		59	29	56	44	71	71	
Ι	#30	Ν		45	14	46	32	69	67	
Z	#40	G		22	9	42	25	68	66	
Е	#100			12	3	27	12	66	61	
	#200			8.2	1.9	16	8.6	65	57	
	0.05mm			8.0	1.4	9.5	8.1	62	50	
	0.01mm			7.8	0.9	7.6	6.0	45	29	
	0.005mm			6.6	0.0	5.1	3.0	31	18	
	0.001mm			3.3	0.0	2.4	0.0	8.5	8.1	

SOILS I ABORATORY SUMMARY

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Login Report								
Customer Name: CITY OF ELLENSBURG	Order ID: 191108055							
501 N ANDERSON ST	Order Date: 11/8/2019							
ELLENSBURG WA 9	9892							
Contact Name: JON MORROW	Project Name: STREET SWEEPING VS							
Comment: PSD SUB TO BUDINGER	CATCH BASIN							
Sample #: 191108055-001 Customer Sample #: 10302019CBS1 C	s							
Recv'd: Matrix: Solid Collector: GORDON CRAN	E Date Collected: 10/31/2019							
Quantity: 1 Date Received: 11/7/2019 2:17:00 PM	Time Collected: 11:00 AM							
Comment:								
Test Lab Method	Due Date Priority							
% SOLIDS S % solids	11/20/2019 Normal (~10 Days)							
%Moisture S %moisture	11/20/2019 Normal (~10 Days)							
Sample #: 191108055-002 Customer Sample #: 10302019CBS2 (cs							
Recy'd: Matrix: Solid Collector: GORDON CRAN	E Date Collected: 10/31/2019							
Quantity: 1 Date Received: 11/7/2019 2:17:00 PM	Time Collected: 11:00 AM							
Comment:								
Test Lab Method	Due Date Priority							
% SOLIDS S % solids	11/20/2019 <u>Normal (~10 Days)</u>							
%Moisture S %moisture	11/20/2019 <u>Normal (~10 Days)</u>							
Sample #: 191108055-003 Customer Sample #: 10302019CBS3 C	s							
Reculd: A Matrix: Solid Collector: GORDON CRAN	E Date Collected: 10/31/2019							
Quantity: 1 Date Received: 11/7/2019 2:17:00 PM	Time Collected: 10/01/2010							
Comment:								
common.								
Test Lab Method	Due Date Priority							
% SOLIDS S % solids	11/20/2019 Normal (~10 Days)							
%Moisture S %moisture	11/20/2019 Normal (~10 Days)							
Sample #: 191108055-004 Customer Sample #: 10302019CBS4 C	S							
Recv'd: Matrix: Solid Collector: GORDON CRAN	E Date Collected: 10/31/2019							
Quantity: 1 Date Received: 11/7/2019 2:17:00 PM	Time Collected: 11:00 AM							
Comment:								
Test Lab Method	Due Date Priority							
% SOLIDS S % solids	11/20/2019 <u>Normal (~10 Days)</u>							
%ivioisture S %moisture	11/20/2019 <u>Normal (~10 Days)</u>							

Customer Name: CITY OF ELLENSBURG	Order ID: 191108055
501 N ANDERSON ST	Order Date: 11/8/2019
ELLENSBURG WA 99892	
Contact Name: JON MORROW	Project Name: STREET SWEEPING VS
Comment: PSD SUB TO BUDINGER	CATCH BASIN
Sample #: 191108055-005 Customer Sample #: 10302019CBS5 TS	
Recv'd: V Matrix: Solid Collector: GORDON CRANE	Date Collected: 10/31/2019
Quantity: 1 Date Received: 11/7/2019 2:17:00 PM	Time Collected: 11:00 AM
Comment:	
Test Lab Method	Due Date Priority
% SOLIDS S % solids	11/20/2019 <u>Normal (~10 Days)</u>
%Moisture S %moisture	11/20/2019 <u>Normal (~10 Days)</u>
Sample #: 191108055-006 Customer Sample #: 10302019CBS6 TS	
Recv'd: Matrix: Solid Collector: GORDON CRANE	Date Collected: 10/31/2019
Quantity: 1 Date Received: 11/7/2019 2:17:00 PM	Time Collected: 11:00 AM
Comment:	
Test Lab Method	Due Date Priority
% SOLIDS S % solids	11/20/2019 <u>Normal (~10 Days)</u>
%Moisture S %moisture	11/20/2019 <u>Normal (~10 Days)</u>
Sample #: 191108055-007 Customer Sample #: 10302019CBS7 TS	
Recv'd: Matrix: Solid Collector: GORDON CRANE	Date Collected: 10/31/2019
Quantity: 1 Date Received: 11/7/2019 2:17:00 PM	Time Collected: 11:00 AM
Comment:	
Test Lab Method	Due Date Priority
% SOLIDS S % solids	11/20/2019 <u>Normal (~10 Days)</u>
%Moisture S %moisture	11/20/2019 <u>Normal (~10 Days)</u>
Sample #: 191108055-008 Customer Sample #: COMPOSITE: CB# 1,2,3,	4 CONTROL
Recv'd: 🔽 Matrix: Solid Collector: GORDON CRANE	Date Collected: 10/31/2019
Quantity: 1 Date Received: 11/7/2019 2:17:00 PM	Time Collected:
Comment:	
Test Lab Method	Due Date Priority
HOLD S hold	10/31/2019 <u>Normal (~10 Days)</u>
Sample #: 191108055-009 Customer Sample #: COMPOSITE: CB# 5,6,7	TEST
Recy'd: Matrix: Solid Collector: GORDON CRANE	Date Collected: 10/31/2019
Quantity: 1 Date Received: 11/7/2019 2:17:00 PM	Time Collected:
Comment:	
Test Lab Method	
	Due Date Priority
HOLD S hold	Due Date Priority 11/20/2019 Normal (~10 Days)

Customer Name: CITY OF ELLENSBURG

501 N ANDERSON ST

WA 99892

Order Date: 11/8/2019

191108055

Contact Name: JON MORROW

Comment: PSD SUB TO BUDINGER

ELLENSBURG

Order ID:

Samples received in a cooler?	Yes
Samples received intact?	Yes
What is the temperature of the sample(s)? (°C)	7.2
Samples received with a COC?	Yes
Samples received within holding time?	Yes
Are all sample bottles properly preserved?	Yes
Labels and chain agree?	Yes
Total number of containers?	7

SAMPLE CONDITION RECORD

Anatek Labs, Inc.

Chain	of	Custody Record	
	1		

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 ○ E Sprague Ste D, Spokane WA 99202 (509) 838-3999 FAX 838-4433

'91108 055 CELL _{Due} 11/20/2019	⁻ 91108	055	CELL	Last Due	11/20/2019	
---	--------------------	-----	------	-------------	------------	--

1 st SAMP 10/31/201 1 st RCVD 11/7/2019

Compan	y Name:	City of Ellensburg		Proje	ct Man	ager:			Jon	Morr	ow			Please refer to our normal turn around times at:
Address	50	1 N Anderson St.		Proje	ct Nam	ne & 1	#:	Street	Sweep	ing v	s Cato	ch Bas	sin	http://www.anateklabs.com/services/guidelines/reporting.asp
City:	Ellensburg	State: WA Zip:	98926	Emai	il Addre	ess :		morrow	vj@ci.e	llens	burg.	wa.us		Normal *All rush orderPhone Next Day* requests must beMail
Phone:	(509) 929-3844		Purci	hase O	rder #	t:							2nd Day* prior approvedFax Other* Email
Fax:				Sam	pler Na	me &	phone	^{e:} Go	rdon Ci	rane	509 9	962-72	36	
	Provide Sa	ample Description		ASSAL		Total o	List	Analys	ses Rec	ques	ted		A Starting	Note Special Instructions/Comments
No. of Sector Sector	Sediment c	ollected in filter socks	and the second s	Prese	ervative:			++	+-+		-+	-+-		Please send a copy of the results to
¢	300	-		Container	nple Volun	ory Weight	ASTM D422							Aimee Navickis-Brasch (aimeen@osbornconsulting.com) & Jon at email above
Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of	Sarr		PSD							
J.	10302019CBS1 CS	10/31/19 11:00 AM	solid			×	×							SW3.5
2	10302019CBS2 CS	10/31/19 11:00 AM	solid			×			+					
2	10302019CBS3 CS	10/31/19 11:00 AM	solid		L	×			\rightarrow				-	
Y.	10302019CBS4 CS	10/31/19 11:00 AM	solid			×			+					
5	10302019CBS5 TS	10/31/19 11:00 AM	solid			×	×	\square	+					
10	10302019CBS6 TS	10/31/19 11:00 AM	solid			×			+				_	
7	10302019CBS7 TS	10/31/19 11:00 AM	solid			×		\square	+					
Contraction of the second														Inspection Checklist
Zan-gilling														Received Intact? (Y) N
Contraction of the second													_	Labels & Chains Agree? (Y) N
														Containers Sealed? (Y) N
ET SE														VOC Head Space? Y N
														VPS/c/1
Contraction of the second	Prin	ted Name	Signature	1/	2	1001	A State	Compa	ny		Date	Tin	ne	and all
Relina	uished by	ardon Grane	Morda	Le	ro	m	-	City	ofE	_	11-67	19 3	i O	Temperature (°C): 1.1 Cug 04
Receiv	ved by	lendy OZ	Mane	dyl	W.			G	note	V.	11-7-	19 1	417	Preservative:
Relinc	uished by	J		0	0			1						1-7-0 11/17
Recei	ved by													Date & Time: 11-1-19 1411
Relinc	uished by													Inspected By: MG
Recei	ved by													



Catch Basin Bulk Density

CITY OF ELLENSBURG	RECEIVED	11/8/2019
Attn: Jon Morrow	REPORTED	11/14/2019
PO Box 48026	REPORT #:	S19-23074
Spokane, WA 99208	Invoice Amt	\$ 270.00

		g/cm [°]
		Wet Basis Dry Basis
Sample ID	Lab ID	BD @ 80% Comp. BD @ 80% Comp.
CBTS1	S19-23074	1.19 0.52
CBTS2	S19-23075	1.16 0.52
CBTS3	S19-23076	0.98 0.46
CBCS1	S19-23077	1.11 0.59
CBCS2	S19-23078	1.11 0.69
CBCS3	S19-23079	1.14 0.76



Laboratory Chain of Custody

Client: Please fill out	: llensburg		Copy of rep	oort sent to: email to Aim	nee and City o	ıf	Page	Date:	of	
Contact: Jon Morro	w		Contact: Ai	mee Navicki	s-Brasch		i ugo		-	
Address: PO Box 48	3026		Address:		o Bradon		.lob #/ Nam	ю.		
City ST Zin · Spokar	ne, WA 992	.08	City ST Zir	· ·			Payment M	ethod: Credi	t Card F	
Telephone: (509) 99	5-0557		Telephone:				r aymont w			
Fax:			Fax:							
e mail: morrowj@ci	.ellensburg	.wa.us	e mail: aim	een@osbor	nconsulting	.com				
					Analyses	Requested	•		Write sample horizontal roy	information in ws. Write test
				Bulk density at 80% max density					name(s) or c boxes at left. the intersecti appropriate.	ode(s) in verticle Mark an "X" at ion(s) where
				SMC					Lab L	Jse Only
Sample Identification	Date Sampled	No. of Containers	Sample Matrix	50.100.90					Sample Condition	LAB ID
110619CBTS1		1	soil	Х						
110619CBTS2		1	soil	Х						
110619CBTS3		1	soil	Х						
110619CBCS1		1	soil	Х						
110619CBCS2		1	soil	Х						
110619CBCS3		1	soil	Х						
Releasing			Date/Time	Receiving					Date	Time
Releasing signature 1				Receiving S	Signature 1					
Releasing signature 2				Receiving S	Signature 2					

Submission of samples to Laboratory with a Chain of Custody constitutes a contract for services requested. Provide payment detail with each COC. If no payment information is provided, you will be contacted by the laboratory. We will make every effort to provide an accurate analysis of this sample. For reasonable cause, we will repeat the tests, but because of factors beyond our control, in sampling procedures and inherent sample variability in compost, soils, plants and water our liability is limited to the price of the tests.

Receiving Signature 3

Releasing signature 3

April 2020 Data Collection Event

Client: City of Ellensburg 501 N. Anderson St. Address: Ellensburg, WA 98926 Jon Morrow Attn:

Work Order: Project: Reported:

WAD0658 Street Sweeping vs Catch Basin 7/6/2020 17:09

Analytical Results Report

Sample Location: Lab/Sample Number: Date Received: Matrix:	CB#1 control WAD0658-01 04/24/20 12:55 Solid	Collect Date: Collected By:	04/23/20 12:00 Gordon Crane				
Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
% Solids	19.2	%	0.100	5/8/20 15:53	ary	SM 2540 G	
TVS	26.9	%	0.0100	5/12/20 11:45	ARY	SM 2540 E	H1

	Analytical Results Report (Continued)												
Sample Location: Lab/Sample Number: Date Received: Matrix:	CB#2 control WAD0658-02 04/24/20 12:55 Solid	Collect Date: Collected By:	04/23/20 12:00 Gordon Crane										
Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier						
Inorganics													
% Solids	27.8	%	0.100	5/8/20 15:53	ary	SM 2540 G							

	Analytical Results Report (Continued)												
Sample Location: Lab/Sample Number: Date Received: Matrix:	CB#3 control WAD0658-03 04/24/20 12:55 Solid	Collect Date: Collected By:	04/23/20 12:00 Gordon Crane										
Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier						
Inorganics													
% Solids	44.0	%	0.100	5/8/20 15:53	ary	SM 2540 G							

	Analytical Results Report (Continued)												
Sample Location: Lab/Sample Number: Date Received: Matrix:	CB#4 control WAD0658-04 04/24/20 12:55 Solid	Collect Date: Collected By:	04/23/20 12:00 Gordon Crane										
Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier						
Inorganics													
% Solids	16.6	%	0.100	5/8/20 15:53	ary	SM 2540 G							

		Analy	tical Results Repo (Continued)	rt			
Sample Location: Lab/Sample Number: Date Received: Matrix:	CB#5 test WAD0658-05 04/24/20 12:55 Solid	Collect Date: Collected By:	04/23/20 12:00 Gordon Crane				
Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
Inorganics							
% Solids	23.4	%	0.100	5/8/20 15:53	ary	SM 2540 G	
TVS	25.0	%	0.0100	5/12/20 11:45	ARY	SM 2540 E	H1

	Analytical Results Report (Continued)												
Sample Location: Lab/Sample Number: Date Received: Matrix:	CB#6 test WAD0658-06 04/24/20 12:55 Solid	Collect Date: Collected By:	04/23/20 12:00 Gordon Crane										
Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier						
Inorganics													
% Solids	23.5	%	0.100	5/8/20 15:53	ary	SM 2540 G							

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - Fax (208) 8829246 - email moscow@anateklabs.com 504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - fax (509) 838-4433 - email spokane@anateklabs.com

	Analytical Results Report (Continued)												
Sample Location: Lab/Sample Number: Date Received: Matrix:	CB#7 test WAD0658-07 04/24/20 12:55 Solid	Collect Date: Collected By:	04/23/20 12:00 Gordon Crane										
Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier						
Inorganics													
% Solids	20.8	%	0.100	5/8/20 15:53	ary	SM 2540 G							

Authorized Signature,

Kathleen a. Sattler

Kathleen Sattler, Laboratory Manager

H1	Sample analysis	performed	past holdir	ng time.
	Sumple analysis	periornicu	past noiui	ig unic

PQL Practical Quantitation Limit

ND Not Detected

MCL EPA's Maximum Contaminant Level

Dry Sample results reported on a dry weight basis

* Not a certified analyte

This report shall not be reproduced except in full, without the written approval of the laboratory The results reported related only to the samples indicated.

	An adala			71		C	4 1							WAD0658
	Anatek Labs, Inc.	 ↓ 1282 A ↓ 504 E Sp 	lturas Drive orague Ste D	, Mosc , Spok	ow II ane V	C US 0 838 VA 99	<i>toa</i> y 43 (2 9202	208) 8 (509	<i>cora</i> 383-283) 838-39	9 FAX 999 FA	X 882- AX 838	·9246 8-443	3	Anatek Log-In # Due: 05/08/20
Compa	ny Name:	City of Ellensbur	g	Proje	ect Mar	nager:		1	J	on Mo	rrow			Turn Arou
Addres	^{s:} 50	01 N Anderson St.		Proje	ect Nar	ne &	#:	Stre	et Swe	epina	vs Ca	atch E	Basin	Please refer to our normal turn around times at: http://www.anateklabs.com/services/guidelines/reporting asp
City:	Ellensburg	State: WA Zip:	98926	Ema	il Addr	ess :		mor	rowi@	ci.eller	nsburc	a.wa.u	us	Normal *All rush orderPhone
Phone:		(509) 929-3844		Purc	hase C	Order #	# :	1						Next Day* requests must beMail 2nd Day* prior approvedFax
Fax:				Sam	pler Na	ame &	phon	e:	Gordor	n Cran	e 509	962-	7236	Other* Email
	Provide S	ample Description	I				List	Ana	lyses I	Reque	sted		Sec. 2	Note Special Instructions/Comments
	Sediment o	collected in filter socks		Containers	ple Volumerative:	y Weight	ASTM D422	nic Content TM D2974						 Please send a copy of the results to Aimee Navickis-Brasch (aimeen@osbornconsulting.com) & Jon
Lab ID	Sample Identification	Sampling Date/Time	Matrix	# of (Sam	ā	PSD	Orgar						at email above
	CB#1 control	04/23/20 12:00 PM	solid			×	×	×						For ASTM D422 testing, combine all test samples, then
A COLOR	CB#2 control	04/23/20 12:00 PM	solid			×								combine all control samples and use the following sieve
	CB#3 control	04/23/20 12:00 PM	solid			×	а. С							sizes: 1", ¾", ½", 3/8", ¼", #10, #16, #30, #40, #100,
	CB#4 control	04/23/20 12:00 PM	solid			×								#200, 0.05mm, 0.01mm, 0.005mm, and 0.001mm.
	CB#5 test	04/23/20 12:00 PM	solid			×	×	×						SIUBS
	CB#6 test	04/23/20 12:00 PM	solid			×		3						0.000
	CB#7 test	04/23/20 12:00 PM	solid			X								
》年 39 48 18 第二章 38 48 48 48 48 48 48 48 48 48 48 48 48 48								10						Inspection Checklist
														Received Intact? N Labels & Chains Agree? N Containers Sealed? N VOC Head Space? N
	Printe	ed Name	Signature	1		1500	41.11	Corn	pany		Date		Time	01911(11)
Relinqu	iished by	rdon Grane	Today	na	m /	7		CH	yof E	burg	4-2	3-20	1:05	M Temperature (°C):
Receiv	ed by	May 07.	n/ e	ind	ALS	2		1	MA	tik	4-2	4-20	175	Preservative:
Relinqu	ished by	J		6	100			Ŭ			f		'	
Receiv	ed by							1		-11				Date & Time: 4-24-20 1255
Relinqu	ished by									:				Inspected By: Ma
Receive	ed by													0



Proudly serving the Inland Northwest since 1976

May 22, 2020

Kathy Sattler Anatek Labs, Inc 504 E Sprague Ave Ste D Spokane, WA 99202

Project Number L20180

PROJECT: Anatek Materials Testing

SUBJECT: Results of Laboratory Testing Report #2

At your request, we provided laboratory testing services for the subject project. Services were limited to the performance of testing of laboratory tests, selected at your discretion.

For this period, our involvement was limited to laboratory testing of two samples delivered to our laboratory on May 14, 2020. Laboratory tests were conducted in general accordance with methods listed on the attached *Laboratory Summary* sheet.

If you have questions regarding this report, please call.

Respectfully Submitted, Budinger & Associates, Inc.

allar

Terri Ballard Laboratory Manager

TJB/kah/Addressee – Kathy Sattler - <u>kathys@anateklabs.com</u>

Attachments: Soils Laboratory Summary - (1 page)

	LAB	ORATORY	' SUMMARY		
LABORATORY NUMBER SAMPLED BY SAMPLE TYPE DATE RECEIVED SAMPLE IDENTIFICATION				20-0334 Client Bulk 5/14/20 WAD0658-8	20-0335 Client Bulk 5/14/20 WAD0658-9
		<u>UNITS</u>	Test Method		
SIEVE ANALYSIS			ASTM D422		
	#4	%		100	100
S	#10			89	96
Ι	#16	Р		89	95
Е	#30	А		85	92
V	#40	S		83	91
Е	#100	S		74	85
	#200	Ι		69	80
S	.05mm	Ν		65	73
Ι	.01mm	G		44	56
Z	.005mm			31	36
Е	.001mm			18	19

SOILS ABORATORY SUMMARY

UPRODUCTS -01 1 112 1000 331.3 331.3 1 100 -04 4 152 1300 351.3 140.43 120 -05 5 178 1300 350.91 140.43 120 -05 5 198 1300 350.91 140.43 120 -06 4 180 1300 350.91 140.43 120 -07 7 182 1000 350.91 140.43 120.44 -08 5 190 1000 350.91 140.43 120.44 -08 5 190 1000 350.91 140.44 120.44 -07 7 182 1000 350.91 140.44 120.44 -08 5 1000 350.91 140.44 120.44 -08 1 182 1000 350.91 120.44 -08 1 182 1000 350.91 120.44 -1 182 1000 350.91 120.44 120.44 1 1 100.55 120.44 11 120.44 1 1 1 11 11 11 1	Lab Sample	le ID	ID JISh	wt (g)	wet (g	(g) (g	(g)	/ NIOIS /	%Solid	Weight	Method		Balance
-02 2 178 1000 406-37 406-37 1 27.8 -04 4 182 1200 350-11 350.11 1 41.0 -05 5 140 1200 350-11 350.11 1 14.0 -05 7 7 182 1000 414.15 414.15 -07 7 1 182 1000 376-16 1 23.4 -07 7 1 182 1000 376-16 1 23.4 -07 7 1 182 1000 376-16 1 23.5 -07 7 1 182 1000 376-16 1 23.5 -07 7 1 182 1000 376-16 1 23.5 -07 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	NA00658-	-01	-	611	1000	331.3	331.3	1	19.2	1		%5	%5 Bal-03
	-	-02	ຍ	311	1000	406-3	7 406-3	1	27.8	1		-	-
-o4 4 182 iao0 350.11 350.11 16.6	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	-03	S	301	1250	650	650	1. I.	44.0	J	1		
		-04	4	281	DOGI	350.7	3.30.9		16.6)			
		So.	S	190	200	419.15	ule.15	1	23.4	1			
		-06	\$	081	1000	372.73	370.73	/	23.5	1			
		-07	L	182	100	376-96	, 376-96	1	20.8	1	1	+	+
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 Appendix C Street & Catch Basin Weight Collected Raw Data

April 2018 Data Collection Event

FINAL QAPP

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

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sear	ment weight Field Data Collect	ion For	m: Roadway an	d Catch Basins				<u></u>	\sim	
	Location (Circle One):		Street Sweep	ling	\langle	Catch Basin Cleaning	>		P	an .
	Date of Data Collection:	4.	-20-18	Time of Data (Collection:	- 9:30 AW		Test site)
	Data Collectors Name:	6	ordan C	Ta ne		10:30 A	NE	Contral sile		
	Comments: Test site CB	Clea	an	- T.	<i>у</i> Р 4	(
	(4-18-19) Weight of Empty Basin:	W1				110,4	pounds			
	Wet Weight of Sediments + Basin:	W ₂				303.4	pounds	4-27-18	10:00 AM	
est Site	Wet Weight of Sediments: W=W ₂ -W	w				193.0	pounds			
Ĩ	Duration Sediment Dewatered (Before Weighing)	т	7 days, 1/2	hr. (h	025) 168.5	time			
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture 0	Content:	Organic Content:		Particle Size Distribution:			- a	
	Number of Samples Collected:	Mositure C	ontent:	Organic Content:		Particle Size Distribution:				
	Chain of Custody Form Completed:	Moisture C	ontent:	Organic Content:		Particle Size Distribution:				
2	Control Ste (Clean -	-TU5#	N					
	(4-18-18) Weight of Empty Basin:	Wı				102,9	pounds			
a	Wet Weight of Sediments + Basin:	W ₂				262.3	pounds	4-27-18.	10:10 AM	
trol Sit	Wet Weight of Sediments: W=W ₂ -W ₁	w				159.4	pounds			
Con	Duration Sediment Dewatered (Before Weighing)	т	7 days		(he	WB) 168.0	time	2	x 2	
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	ontent:	Organic Content:		Particle Size Distribution:			. I	
	Number of Samples Collected:	Mositure C	ontent:	Organic Content:		Particle Size Distribution:				
	Chain of Custody Form Completed:	Moisture C	ontent:	Organic Content:		Particle Size Distribution:				

Sediment Weight Field Data Collection Form: Roadway and Catch Racing

3/1/2018

FINAL QAPP

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

	Location (Circle One):		Street Sweep	ing >		Catch Basin Cleaning				Par
	Date of Data Collection:	4 -	20-18	Time of Data	Collection:	9:30 AM	Sim.	Test site	• 0.000 0.000 40	13.2
	Data Collectors Name:	Go	rden Crane			10:30 AM	State Services and	Control site		
	Comments: Test site sure	ef	- Tub #	2						
	4-18-18 Weight of Empty Basin:	W1				111.3	pounds			
	Wet Weight of Sediments + Basin:	W ₂				1872.7	pounds	4-27-18	10:05 AM	
est Site	Wet Weight of Sediments: W=W ₂ -W ₁	w				1761.4	pounds			
Ĕ	Duration Sediment Dewatered (Before Weighing)	T	Thays 1/2	chri h	OURS	168.5	time			
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture (Content:	Organic Content:		Particle Size Distribution:			^{сс} а	
	Number of Samples Collected:	Mositure (Content:	Organic Content:	Sprinkers was	Particle Size Distribution:				
	Chain of Custody Form Completed:	Moisture (Content:	Organic Content:		Particle Size Distribution:				
4	Control site s.	neep	-756	4 4					in. B	
	4-18-18 Weight of Empty Basin:	Wı				115.Z	pounds			
	Wet Weight of Sediments + Basin:	W ₂				2932.9	pounds	4-27-18	10:20 AM	
trol Sit	Wet Weight of Sediments: W=W ₂ -W ₁	w				2817,7	pounds			
Con	Duration Sediment Dewatered (Before Weighing)	т	7 days	()	have	5) 168.0	time		at at	
, ¹⁶	Cone & Quartering Technique Followed to Collect Samples for:	Moisture (Content:	Organic Content:		Particle Size Distribution:				
	Number of Samples Collected:	Mositure (Content:	Organic Content:		Particle Size Distribution:				
	Chain of Custody Form Completed:	Moisture (Content:	Organic Content:		Particle Size Distribution:				

Sediment Weight Field Data Collection Form: Roadway and Catch Basins

3/1/2018

June 2018 Data Collection Event

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

	Location (Circle One):	Street Swee	ping		Catch Basin Cleaning			
	Date of Data Collection:	6-19-18	Time of Data	Collection:	10:30 AV	M		
	Data Collectors Name:	Gordon (Crave		••••••••••••••••••••••••••••••••••••••			
	Comments: (North side	e) Sweep	Tub	#3		9		Pg.1
	Weight of Empty Basin:	: w ₁			110,3	pounds		
6	Wet Weight of Sediments + Basin:	: W ₂		2	274,4	pounds	7-3-18	3:00 PM
est Site	Wet Weight of Sediments W=W ₂ -W	W			164.1	pounds		
Te	Duration Sediment Dewatered (Before Weighing	е т (4 с	lays, 5 hi	5		time		
	Cone & Quartering Technique Followed to Collect Samples for	Moisture Content:	Organic Content:		Particle Size Distribution:			10) 16
	Number of Samples Collected	: Mositure Content: 3	Organic Content:		Particle Size Distribution:			
	Chain of Custody Form Completed	: Moisture Content:	Organic Content:		Particle Size Distribution:			
	Comments:							
	Weight of Empty Basin:	W ₁		and the second		pounds		
	Wet Weight of Sediments + Basin:	W ₂	and the second se			pounds		
trol Site	Wet Weight of Sediments: W=W ₂ -W	w v				pounds		
Cont	Duration Sediment Dewatered (Before Weighing)		and a second			time		8 a
i.	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Content:	Organic Content:		Particle Size Distribution:			
	Number of Samples Collected:	: Mositure Content:	Organic Content:		Particle Size Distribution:			
	Chain of Custody Form Completed:	: Moisture Content:	Organic Content:		Particle Size Distribution:			8 - 192

Sediment Weight Field Data Collection Form: Roadway and Catch Basins

FINAL QAPP

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

-eu	Location (Circle One):		Street Sweep	ing	Catch Basin	Cleaning	
4	Date of Data Collection:	6	-19-18	Time of Data Colle	ction: 10:	30 \$	L-M
	Data Collectors Name:	(Gardon C	raine			
	Comments: (North Side)) (1	06 #				
	Weight of Empty Basin:	W1			10	7.8	pounds
n	Wet Weight of Sediments + Basin:	W ₂			14	1.8	pounds
est Site	Wet Weight of Sediments: W=W2-W1	w			NU	54.0	pounds
Te	Duration Sediment Dewatered (Before Weighing)	т	14	days, 5	havis		time
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	ontent: V	Organic Content:	Particle Size Dis	tribution:	
	Number of Samples Collected:	Mositure C	ontent: 3	Organic Content:	Particle Size Dis	tribution:	
	Chain of Custody Form Completed:	Moisture C	ontent:	Organic Content:	Particle Size Dis	tribution:	
4	Comments: (South side	2) -	TUB#	4 Note: V	isually, mor	e hay	chaff
	Weight of Empty Basin:	W1			100).8	pounds
7.	Wet Weight of Sediments + Basin:	W ₂			151	12	pounds
trol Site	Wet Weight of Sediments: W=W ₂ -W ₁	w			50	2,4	pounds
Con	Duration Sediment Dewatered (Before Weighing)	т	140	lays 5 hr	5		time
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	ontent:	Organic Content:	Particle Size Dis	tribution:	
	Number of Samples Collected:	Mositure C	ontent: 3	Organic Content:	Particle Size Dis	tribution:	
	Chain of Custody Form Completed:	Moisture C	ontent:	Organic Content:	Particle Size Dis	tribution:	

Pa. 2

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in S. side tub compared to N. Side

3/1/2018

FINAL QAPP

August 2018 Data Collection Event

FINAL QAPP

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

	Location (Circle One):		Street Sweep	ping		Catch Basin Cleaning	0	
	Date of Data Collection:	g.	-23-18	Time of Data	Collection:	9AM		
	Data Collectors Name:		Gordon	-Crave				
ľ	Comments: (North -	ide)) S	neep	TOb	# 3		tage
	Weight of Empty Basin:	W1	1	14.5			pounds	
(Wet Weight of Sediments + Basin:	W ₂	2	270,1	9 A	M 8-30-18)	pounds	
st Site	Wet Weight of Sediments: W=W ₂ -W ₁	w		155,6			pounds	l.
Te	Duration Sediment Dewatered (Before Weighing)	т		·	7	days	time	T.
Ī	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Co	ontent:	Organic Content:	/	Particle Size Distribution:	/	
Ī	Number of Samples Collected:	Mositure Co	ontent: 3	Organic Content:	Transfer Transfer	Particle Size Distribution:		()
Ī	Chain of Custody Form Completed:	Moisture Co	ontent:	Organic Content:		Particle Size Distribution:	<	-
	Comments:						/	-
	the second se							
ſ	Weight of Empty Basin:	W1					pounds	
Ī	Wet Weight of Sediments + Basin:	W ₂			_		pounds	
rol Site	Wet Weight of Sediments: W=WW-	w					pounds	
Cont	Duration Sediment Dewatered (Before Weighing)	T	and a second				time	- -
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Co	ontent:	Organic Content:	/	Particle Size Distribution:]
	Number of Samples Collected:	Mositure Co	ontent:	Organic Content:	T.	Particle Size Distribution:		
	Chain of Custody Form Completed:	Moisture Co	ontent:	Organic Content:		Particle Size Distribution:		

. ...

705-12 1083 149.6 756±1 109,1 137.4 Tub #3 114,5 270,1

3/1/2018

и и и и и и и и и ници и нации и
STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

August Rage 2

	Location (Circle One):	Street Sweeping				Catch Basin Cleaning		
	Date of Data Collection:	0-	23-18	Time of D	Data Collection:	ZAM		
	Data Collectors Name:	<	Sordan C	rane		2		
	Comments:	- sid	e) T	Jb #	/			
	Weight of Empty Basin:	W1	10	9, [pounds	
	Wet Weight of Sediments + Basin:	W ₂	13	7.4	-	4 PM 3-29-18	pounds	
st Site	Wet Weight of Sediments: W=W ₂ -W ₁	w	2	28.3			pounds	
Te	Duration Sediment Dewatered (Before Weighing)	т			(-	days 7 hrs	time	
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture 0	Content:	Organic Content:	\checkmark	Particle Size Distribution:	\checkmark	
	Number of Samples Collected:	Mositure 0	Content: 3	Organic Content:	No. of Street,	Particle Size Distribution:		
	Chain of Custody Form Completed:	Moisture C	Content:	Organic Content:		Particle Size Distribution:		
	Comments: (South side) -	TJb#	2				
	Weight of Empty Basin:	Wı	10	8:3			pounds	
5	Wet Weight of Sediments + Basin:	W ₂	1-{	9,6		4 PM 8-29-8	pounds	
trol Site	Wet Weight of Sediments: W=W ₂ -W ₁	w	2	f1.3			pounds	
Con	Duration Sediment Dewatered (Before Weighing)	т			4	odays This	time	
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	Content:	Organic Content:	V	Particle Size Distribution:	/	
	Number of Samples Collected:	Mositure C	Content: 3	Organic Content:	a description of the later	Particle Size Distribution:		
	Chain of Custody Form Completed:	Moisture C	Content:	Organic Content:		Particle Size Distribution:		

Sediment Weight Field Data Collection Form: Roadway and Catch Basins

3/1/2018

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October 2018 Data Collection Event

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

Sed	iment Weight Field Data Collect	ion For	m: Roadway ar	d Catch Basins			lage !
	Location (Circle One):		Street Sweep	bing	Catch Basin Cleaning		U
	Date of Data Collection:	16	-31-18	Time of Data Collection	11:00 AM		Sweep (CB collect on 10-24-18
	Data Collectors Name:	6	earden C	Fand			
	(North Side)	\searrow	weat	7.6#4			empts 10-23-1
	Weight of Empty Basin:	W1			109,5	pounds	100 + 1 108,1
5	Wet Weight of Sediments + Basin:	W2	10-31-13	10.00 AM	241,6	pounds	#Z 101.9 "
st Site	Wet Weight of Sediments: W=W ₂ -W ₁	w			132.1	pounds	# 4 100 - 11
Te	Duration Sediment Dewatered (Before Weighing)	т	7 drus	1 hour		time	# 4 109,5
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture	Content:	Organic Content:	Particle Size Distribution:		#3 104.3
	Number of Samples Collected:	Mositure (Content: 3	Organic Content:	Particle Size Distribution:		
	Chain of Custody Form Completed:	Moisture (Content: 🗸	Organic Content:	Particle Size Distribution:	~	
7	Comments: (South side)) Si	NEED -	Tub#3	Collected	3:30 HN	3
	Weight of Empty Basin:	W1	10-29-18		104.3	pounds	
	Wet Weight of Sediments + Basin:	W ₂	10-31-18	3	75/2.6	pounds	Note: Last swept in April 2018.
trol Site	Wet Weight of Sediments: W=W2-W1	w		3	652,3	pounds	
Cont	Duration Sediment Dewatered (Before Weighing)	т	I day 2.	5 hours		time	
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture (Content: 3	Organic Content:	Particle Size Distribution:		e
	Number of Samples Collected:	Mositure (Content: 3	Organic Content:	Particle Size Distribution:		
	Chain of Custody Form Completed:	Moisture (Content: 🗸	Organic Content:	Particle Size Distribution:	\checkmark	PC
_	And and a second s						W File

Page Sweep CB collect on 10-24-18 empts 10-23-18 ± Z 101.9 " # 4 109,5 10 #3 1043

3/1/2018

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

	Location (Circle One):		Street Sweep	ing		Catch Basin Cleaning	6		
÷	Date of Data Collection:	10-31 - 18 Time of Data Colle			Time of Data Collection:	n: 11:00 Am			
	Data Collectors Name:	Gordon Crave							
	Comments: (Narth side	.)	706 £	2	×				
	Weight of Empty Basin:	W1				101.9	pounds		
~	Wet Weight of Sediments + Basin:	W2				174,7	pounds		
ist Site	Wet Weight of Sediments: W=W ₂ -W ₁	w				72,3	pounds		
Te	Duration Sediment Dewatered (Before Weighing)	т	7 dans	(hr		time		
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	Content:	Organic	Content:	Particle Size Distribution:			
	Number of Samples Collected:	Mositure C	Content: 3	Organic	Content:	Particle Size Distribution:	/		
	Chain of Custody Form Completed:	Moisture C	Content: 🗸	Qrganic	Content:	Particle Size Distribution:	~		
-	Comments: (South S	(de)	H dej	are-					
	Weight of Empty Basin:	W1				108,1	pounds		
	Wet Weight of Sediments + Basin:	W ₂				168.)	pounds		
rol Site	Wet Weight of Sediments: W=W ₂ -W ₁	w				60.0	pounds		
Cont	Duration Sediment Dewatered (Before Weighing)	т	7 dans	(h	١٢.		time		
1	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	Content:	Organic	Content:	Particle Size Distribution:			
	Number of Samples Collected:	Mositure C	iontent: 3	Organic	Content:	Particle Size Distribution:	/		
	Chain of Custody Form Completed:	Moisture C	Content:	Organic	Content:	Particle Size Distribution:	V		

Page Z Suicip/CB Collect on 10-24-18

3/1/2018

April 2019 Data Collection Event

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

	Location (Circle One):		Street Sweep	ing	Catch Basin Cleaning	
	Date of Data Collection:	4-2	25-19	Time of Data Collecti	on:	
	Data Collectors Name:	Gora	lon Crar)c		
	Comments:	(e)	Sweer	o Tub:	# 3	
	Weight of Empty Basin:	W1	U			pounds
	Wet Weight of Sediments + Basin:	W ₂	w2 1528			
st Site	Wet Weight of Sediments: W=W ₂ -W ₁	w		1417		pounds
e)	Duration Sediment Dewatered (Before Weighing)	т	5 day 2	2hr. 15min =	144.25 hr.	time
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Co	ntent:	Organic Content: 🗸	Particle Size Distribution:	~
	Number of Samples Collected:	Mositure Content:		Organic Content:	Particle Size Distribution:	
	Chain of Custody Form Completed:	Moisture Co	ntent:	Organic Content:	Particle Size Distribution:	
1	Comments:	9				
	Weight of Empty Basin:	W1				pounds
ĺ	Wet Weight of Sediments + Basin:	W ₂		and the second		pounds
trol site	Wet Weight of Sediments: W=W ₂ -W ₁	w				pounds
Con	Duration Sediment Dewatered (Before Weighing)	J. J. Com	J.		ā.	time
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Content:		Organic Content:	Particle Size Distribution:	
	Number of Samples Collected:	Mositure Co	ntent:	Organic Content:	Particle Size Distribution:	
Ī	Chain of Custody Form Completed:	Moisture Co	ntent:	Organic Content:	Particle Size Distribution:	Sur, n.

Note: roadway partly swapt by private parts)

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STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

	Location (Circle One):		Street Sweepi	ng	Catch Basin Cleaning	Catch Basin Cleaning		
	Date of Data Collection:	4	4-25-15 Time of Data Collection:					
	Data Collectors Name:				÷			
	Comments: (South Side)	=	1	jb #2	-			
	Weight of Empty Basin:	W1		105				
	Wet Weight of Sediments + Basin:	W2		230		pounds		
est Site	Wet Weight of Sediments: W=W ₂ -W ₁	w			pounds			
Te	Duration Sediment Dewatered (Before Weighing)	т	5 Lays +	- 22 hr 15 min =	144.25 hr.	time		
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	ontent: V	Organic Content: 🗸 🗸	Particle Size Distribution:	~		
	Number of Samples Collected:	Mositure C	ontent: 3	Organic Content:	Particle Size Distribution:			
	Chain of Custody Form Completed:	Moisture C	ontent:	Organic Content:	Particle Size Distribution:			
	Comments: (North side)	8.	TUB off	n 4		18		
	Weight of Empty Basin:	W1		(14		pounds		
	Wet Weight of Sediments + Basin:	W2		183	M	pounds		
rrol Site	Wet Weight of Sediments: W=W ₂ -W ₁	w		69	3	pounds		
Cont	Duration Sediment Dewatered (Before Weighing)	т	5 kuy	22hr Ismin	= 144.25 hr.	time		
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	ontent: 🗸	Organic Content: 🗸	Particle Size Distribution: 🗸	/		
	Number of Samples Collected:	Mositure C	ontent: 3	Organic Content:	Particle Size Distribution:			
	Chain of Custody Form Completed:	Moisture C	ontent:	Organic Content:	Particle Size Distribution:			

Start decant 11:00 4-26-19

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Era 9:15 5-2-19

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June 2019 Data Collection Event

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

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	Location (Circle One):		Street Sweeping			Catch Basin Cleaning	
	Date of Data Collection:	6	-24-19	Time of Data	Collection:		
	Data Collectors Name:	6	Fordan (Trane			
	Comments: (South S	ide)) Swe	eep l	Jub	#4	
	Weight of Empty Basin:	Wı		100		2	pounds
0	Wet Weight of Sediments + Basin:	W ₂	W2 292				
st Site	 Wet Weight of Sediments: W=W2-W1 	w	w 192				
Ľ,	Duration Sediment Dewatered (Before Weighing)	т	6	days 23	hrs.	(167 hrs)	time
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	ontent:	Organic Content:	/	Particle Size Distribution:	
	Number of Samples Collected:	Mositure C	ontent: 3	Organic Content:	\langle	Particle Size Distribution:	~
	Chain of Custody Form Completed:	Moisture C	ontent:	Organic Content:		Particle Size Distribution:	
а	Comments:						
	Weight of Empty Basin:	W1					pounds
	Wet Weight of Sediments + Basin:	W ₂					pounds
trol Site	Wet Weight of Sediments: W=W ₂ -W ₁	w	Na _{ba}	and the street and the			pounds
Con'	Duration Sediment Dewatered (Before Weighing)	т					time
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	ontent:	Organic Content:		Particle Size Distribution:	
	Number of Samples Collected:	Mositure C	ontent:	Organic Content:		Particle Size Distribution:	
	Chain of Custody Form Completed:	Moisture C	ontent:	Organic Content:		Particle Size Distribution:	

Sediment Weight Field Data Collection Form: Roadway and Catch Basins

3/1/2018

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STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

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	Location (Circle One):		Street Sweep	ing	Catch Basin Cleaning			
	Date of Data Collection:	6	-24-19	Time of Data Collecti	on:			
	Data Collectors Name:		Gordon	rane				
	Comments: (South	Sid	e) -	TU6 # 3)			
	Weight of Empty Basin:	W1		106				
6	Wet Weight of Sediments + Basin:	W ₂		183				
est Site	Wet Weight of Sediments: W=W ₂ -W ₁	w		77	pounds			
Ē	Duration Sediment Dewatered (Before Weighing)	т	-6	days 23hr	(167 hrs)	time		
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	Content:	Organic Content:	Particle Size Distribution:			
	Number of Samples Collected:	Mositure C	Content: 3	Organic Content:	Particle Size Distribution:			
	Chain of Custody Form Completed:	Moisture C	Content:	Organic Content:	Particle-Size Distribution:	and the second s		
•	Comments: (North side	e).	755	#2				
	Weight of Empty Basin:	wı	Υ.	109		pounds		
\bigcirc	Wet Weight of Sediments + Basin:	W2		131		pounds		
rol Site	Wet Weight of Sediments: W=W ₂ -W ₁	w		22		pounds		
Cont	Duration Sediment Dewatered (Before Weighing)	т	6.	days 23 hr	(167 hrs)	time		
i.	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	Content:	Organic Content:	Particle Size Distribution:			
	Number of Samples Collected:	Mositure C	Content: 3	Organic Content:	Particle Size Distribution:			
	Chain of Custody Form Completed:	Moisture C	Content:	Organic Content:	Particle Size Distribution:	and the second sec		

Page 2

start de cant 6-2:5-19 @ 11:30 AM 7-2-19 @ 10:30 AM August 2019 Data Collection Event

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

Page 1

3 jars)

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edir	nent Weight Field Data Collect	ion Fort	n: Roadway an	Augue d Catch Basins	st 2019	7
	Location (Circle One):		Street Sweep	ing	Catch Basir	Cleaning
	Date of Data Collection:		3-19	Time of Data	Collection: 10	:30
	Data Collectors Name:	G	iordon (Crane		744
	Comments: (South Side) <	Swee	o TUE	, # 4	
	Weight of Empty Basin:	W1		101		pounds
0	Wet Weight of Sediments + Basin:	W ₂		261		pounds
st site	Wet Weight of Sediments: W=W ₂ -W ₁	w		160		pounds
	Duration Sediment Dewatered (Before Weighing)	т	B dan	5. 31/2	nrs	time
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	ontent:	Organic Content:	Particle Size Dis	tribution:
ſ	Number of Samples Collected:	Mositure C	ontent: 3	Organic Content:	Particle Size Dis	tribution:
	Chain of Custody Form Completed:	Moisture C	ontent:	Organic Content:	Particle Size Dis	tribution:
	Comments:					
ſ	Weight of Empty Basin:	w ₁			and a formation of the second s	pounds
ſ	Wet Weight of Sediments + Basin:	W ₂		and the second s	and the second	pounds
	Wet Weight of Sediments: W=W ₂ -W ₁	w	and the second designed and the second designed and the second designed and the second designed and the second	armsenerations and the second second second		pounds
	Duration Sediment Dewatered (Before Weighing)	т	The state of the s	and the second		time
Ī	Cone & Quartering Technique Followed to Collect Samples for:	Moisture C	ontent:	Organic Content:	Particle Size Dis	tribution:
	Number of Samples Collected:	Mositure C	ontent:	Organic Content:	Particle Size Dis	tribution:
	Chain of Custody Form Completed:	Moisture Co	ontent:	Organic Content:	Particle Size Dis	tribution:

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Note: Almost no water in this tob. Most dewatering by evaporation.

Weighed tub 9-10-19 2:00 PM

3/1/2018

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STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

	Location (Circle One):	Street Sw	eeping	Catch Basin Cleaning)	\sim
	Date of Data Collection:	3-28-19	Time of Data Coll	ection: 10:30		Po
	Data Collectors Name:	Gora	on Grane			lage Z
	Comments: South	Side)	TU5 #	3		
	Weight of Empty Basin:	w ₁	08		pounds	
h	Wet Weight of Sediments + Basin:	W2	167		pounds	
ist Site	Wet Weight of Sediments: W=W ₂ -W	: w	59		pounds	weighed tubs
P	Duration Sediment Dewatered (Before Weighing)	т (За)	aus, 1 hr. 1.	5 min	time	11:45 AM
	Cone & Quartering Technique Followed to Collect Samples for	Moisture Content:	Organic Content:	Particle Size Distribution:	/	
	Number of Samples Collected	: Mositure Content: 2	Organic Content:	B Particle Size Distribution:	3	(3 jars)
	Chain of Custody Form Completed:	: Moisture Content:	Organic Content:	Particle Size Distribution:		
	Comments: (North S	side) -	TUB # 2	7		
	Weight of Empty Basin:	W1	103		pounds	ນ ⁶⁴ ຊ
6	Wet Weight of Sediments + Basin:	W ₂	156		pounds	
trol Site	Wet Weight of Sediments: W=W ₂ -W ₁	w	53.		pounds	×
Cont	Duration Sediment Dewatered (Before Weighing)	т (З.	days, Ihr. 15.	min	time	a e e
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Content:	Organic Content:	Particle Size Distribution:	\checkmark	, L #
	Number of Samples Collected:	: Mositure Content:	Organic Content:	Particle Size Distribution:	3	(3 jars)
	Chain of Custody Form Completed:	: Moisture Content:	Organic Content:	Particle Size Distribution:	\checkmark	- ² 1.

Sediment Weight Field Data Collection Form: Roadway and Catch Basins

FINAL QAPP

3/1/2018

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9-10-19

October 2019 Data Collection Event

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

<u> </u>	Location (Circle One):	Street Sweeping	Catch Basin Cleaning		ρ ,
	Date of Data Collection:	10-30-19	Time of Data Collection: 10:30		Tage 1
	Data Collectors Name:	Gordon Cre	ive		
		h Side) Sweed Tu	5 # 4		
	Weight of Empty Basin:	w1 02	2	pounds	
F	Wet Weight of Sediments + Basin:	w ₂ 398	3	pounds	R
ct Cita	Wet Weight of Sediments: W=W2-W1	w 29	6	pounds	
T	Duration Sediment Dewatered (Before Weighing)	T & days,	3 hr	time	weighed tub 11-Z-19
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Content: Organic	Content: Particle Size Distribution:	\sim	1: SO FIL
	Number of Samples Collected:	Mositure Content: Organic	Content: Particle Size Distribution:		
	Chain of Custody Form Completed:	Moisture Content: Organic (Content: Particle Size Distribution:	/	
	Comments: (NbvHh	Side) Sweer	+ 20+		
	Weight of Empty Basin:	w1 108		pounds	
6	Wet Weight of Sediments + Basin:	W2 2139	2	pounds	Weighed +6 11-7-19 1:30 PM
trol Site	Wet Weight of Sediments: W=W ₂ -W ₁	w 203	1	pounds	
Con	Duration Sediment Dewatered (Before Weighing)	T & days	3 hr.	time	e 8 e
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Content: Organic (Content: Particle Size Distribution:		10 ⁽²⁾ - 4
	3 Number of Samples Collected:	Mositure Content: Organic (Content: Particle Size Distribution:		
	Chain of Custody Form Completed:	Moisture Content: Organic O	Content: Particle Size Distribution:	~	

Sediment Weight Field Data Collection Form: Roadway and Catch Basins

3/1/2018

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STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

	Location (Circle One):	Street Sweeping Catch Basin Cleaning		\wedge		
	Date of Data Collection:	0-30-19 Time of Data Collection: 0:30		Prop		
	Data Collectors Name:	Gordon Grane		I ge ~		
	Comments: South	Side) (B Tub # 3				
	Weight of Empty Basin:	w1 09	pounds			
A	Wet Weight of Sediments + Basin:	w ₂ 159	pounds	unided 11-5-19 3:30 pm		
est Site	Wet Weight of Sediments: W=W2-W1	w 50	pounds	. weiging 11-5-17 5-07		
Ľ	Duration Sediment Dewatered (Before Weighing)	T G days 5 hrs	time	& weighed tubs //		
	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Content: V Organic Content: Particle Size Distribution:	\checkmark			
	Number of Samples Collected:	Mositure Content: Organic Content: Particle Size Distribution:	\checkmark			
	Chain of Custody Form Completed:	Moisture Content: Particle Size Distribution:	/			
-	Comments: (North	Side) CB TUB # 2				
	Weight of Empty Basin:	w1 104	pounds			
P	Wet Weight of Sediments + Basin:	W2 128	pounds	weighed 11-5-19 3:30pm		
trol Site	Wet Weight of Sediments: W=W ₂ -W ₁	w 24	pounds	U		
Cont	Duration Sediment Dewatered (Before Weighing)	T Gdays 5 hrs	time	a 8 a		
0	Cone & Quartering Technique Followed to Collect Samples for:	Moisture Content: V Organic Content: V Particle Size Distribution:	\checkmark	2 ¹³ - 14		
	Number of Samples Collected:	Mositure Content: Organic Content: Particle Size Distribution:	/	×		
	Chain of Custody Form Completed:	Moisture Content: V Organic Content: V Particle Size Distribution:	/	s 6a		

Sediment Weight Field Data Collection Form: Roadway and Catch Basins

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Appendix D Catch Basin Depth Raw Data

April 2018 Data Collection Event

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

All -Rim to IE:

Catch Basin Sediment Depth Measures	ments			6					
CB Cleaning Month	ATRIL	Data C	Collector Name:	600	PG	-201	<u>ې د</u>		(Da, l)
Date	4-19-18	Data C	Collection Time:	1 IP	\sim				
Location (Circle One):	4-20-18 Sween clean		Test-Site			Contr	ol-Site		
Comments:	4-20-18 #4 \$#8 Rim.	to IE all 80	В						
4-26-18 Remaining D	cpth of CB empty								
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4,54	4.53	4.54	4.50	4,48	Inches	OK - No Cenc,
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	Dinvert		2.19	15 12	110		Inches	4.54-2.19=2.35
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.45	4.35	4.25	4.42	4.45	inches	- aut
Catch Basin #: 3	Depth Measurement	Location in CB:	1	2	3	4	5	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	3.86	3.86	3.92	3.92	inches	Small Wab NW Corner
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	Dinvert		1,52				inches	(2,34)
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.65	3.62	3.62	3.60	3,60	inches	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	. 4	5	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4,47 (4.35	4.46	4,42	4.47	inches	Most has some concre
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	Dinvert		2,08	3			inches	(2.39)
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.15	4,15	4.05	4.25	4.18	inches	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{св}	3.93	3,93	3.92	3,93	3.94	inches	Small blobs each corne
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		1,60				inches	(2,33)
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,55	3,55	3.48	3.60	3.52	inches	

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STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

CB Cleaning Month:	APRIL	Data C	ollector Name:	602	Don-	JON)		(Pg
Date:	4-19-18 sed. depth	Data C	collection Time: 2 pm						
Location (Circle One):	4-20-18 Sweep, clean		Test-Site	•	1	Contr	ol-Site		
4-26-18 Remaining Depth of CB Rupty									
Catch Basin #: 5	Depth Measurement	Location in CB:	1	2	з	4	5	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.81	3,79	3.80	3,87	3.85	inches	Clean, N
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB-to bottom of the inside of the pipe	D _{invert}		,40				inches	(2,41)
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.60	3.55	3.48	3.58	3.65	inches	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.26	4.26	4.25	4,30	4.28	inches	Clean, No
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	. (, 88					iņenes	(2.38)
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.95	3.90	3.90	4.00	3.92	inches	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	3.85	3.85	3,89	3,90	inches	Clean, No
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	Dinvert		1.58			r	inches	2.28
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.55	3.55	3.50	3.80	3.50	inches	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Units	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.05*	3,93	3.93	4,28	4,22	inches .	B105 of
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		1.95	, ,			inches	REPOS
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to	D _{CB-S}	3.90	3.75	365	4,35	3.95	inches	*

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3/1/2018

June 2018 Data Collection Event

CB Cleaning Month:	JMC 2018	Data Coll	lector Name:	C					
Date:	June 18 7 19	Data Coll	ection Time:	21					
Comments:			lest-Site				Control-Site	>	
	· · · · · · · · · · · · · · · · · · ·			8		57			
Catch Basin #: 5	Depth Measurement L	ocation in CB:	1	2	3	4	5	Avg	Unit
6-19-(8 Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,81	3.79	3,80	3.87	3,85	3.82	decin fee
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2,41		la -			decin fee
6-18-18 Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,59	3.66	3.74	3,80	3.85	3.73	decin fee
Catch Basin #: 6	Depth Measurement Lo	ocation in CB:	1	2	3	4	5	Avg	Unit
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.26	4.26	4.25	4,30	4,28	427	decim feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2,38					decim feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.97	4,23	4:13	4.15	4,22	4.15	decim feet
Catch Basin #:	Depth Measurement Lo	ocation in CB:	1	2	3	4	5	Avg	Unit
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,86	3,85	3,85	3,99	3,90	3.87	decim feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2.28					decim feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,70	3,76	3,7.9	3,78	3,83	3.71	decim feet
Catch Basin #: 👸	Depth Measurement Lo	ocation in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.05	3,93*	3.93*	4.28*	4.27	4.08*	decim feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2,10	(* This C concrete	D has blo on floor	of CE)	decim feet
	Measure from top of sediment in CB to	D _{CB-S}	3.93	3.88	3.87	477	4.18	4.63	decim

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CB Cleaning Month:	June 2018	Data Coll	ector Name:	Gordon Grave					
Date:	June 18 519, 2018	Data Collection Time:							
Location (Circle One):	,	(Test-Site				Control-Site		
Comments: Sediment measu	ved 6-18-18	ed 6-18-18							
Empty CB's	6-19-18								
Catch Basin #: 🗸	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
6-19-18 Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.54	4.53	4.54	4.50	4:50	452	decimal feet
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		23	5 (B	avely felt	angsift	>	decimal feet
6-13-18 Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4,46	4.51	4.41	4,49	4,50	447	decimal feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	3,96	3.26	3.92	3.92	3.98	decimal feet
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		Z.3.	£				decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.85	3,83	3.84	3,79	3,83	3.33	decimal feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.47	4.35	4,46	4.42	4.47	4,43	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2.35	Ì				decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4,32	4.13	4.36	4.32	4.43	4:31	decimal feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.93	3,93	3.92	3.93	3,94	3,93	decimal feet
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2,3:	3		2		decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,81	3,85	3,81	3,88	3,86	3.84	decimal feet

August 2018 Data Collection Event

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	CB Cleaning Month	Huaust 22 2018	Data Coll	ector Name:							
	Date:	August 16, 2018	Data Coll	ection Time:							
	Location (Circle One):		\sim	Test-Site		2		Control-Site			
Comments:	Sediment Measured	8-16-18									
Catch Basin #:	4	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
	Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4,54	453	4.54	4,50	4.50	4.52	decimal feet	
	Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2.3	35		12			decimal feet	
8-16-18	Depth to Top of Sediment in CB	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.49	4,48	4,44	. 4.49	4,52	4.48	decimal feet	
Catch Basin #:	3	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
4 N	Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	3,86	3,93	3,92	3,92	3.90	decimal feet	
	Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2,	34	17 E		۰ ۲		decimal feet	
- 	Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,83	3.83	3.88	3,88	3,88	3.86	decimal feet	
Catch Basin #:	2	Depth Measurement I	Location in CB:	1	2	3	4	5	Avg	Units	
	Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4,47	4.35	4.46	4.42	4.47	443	decimal feet	
	Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2.	39					decimal feet	
	Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.28	4,31	4.36	4.32	4,40	4,33	decimal feet	
Catch Basin #:	1	Depth Measurement I	Location in CB:	1	2	3	4	5	Avg	Units	
	Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,93	3.93	3,92	3,93	3.94	3.93	decimal feet	
	Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	Z	33	2	-	•		decimal feet	
	Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,82	3,82	3.90	3.90	3.88	2,81	decimal feet	

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			16 I.	1 age lamon						
CB Cleaning Month	" August 22 2018	Data Col	lector Name:	Gordon Crane						
Date	" August 16, 2018	Data Col	lection Time:	2 		5.				
Location (Circle One)			Test-Site	Control-Site						
Note: both CB 133 are 1/2 full of water, with hay chatf floating.										
Catch Basin #: 5	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,81	3.79	3,32	3,84	3,81	3,81	decimal feet	
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2	,41		11.17			decimal feet	
8-16-18 Depth to Top of Sediment in CB	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,60	3.72	3,83	3,81	3,79	3.75	decimal feet	
Catch Basin #: 6	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.26	4.25	4.29	4.29	4.28	4.7.7	decimal feet	
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	Z	.38	-	4			decimal feet	
Depth to Top of Sediment in CB	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4,15	4,22	4.26	4,23	4.26	4.22	decimal feet	
Catch Basin #: 7	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,86	3.86	3,88	3.90	3,86	3.88	decimal feet	
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2	.28	(,CB 1/2	full of wa	ter, hay chat	f flooting	decimal feet	
Depth to Top of Sediment in CB	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,83	3.86	3.88	3.90	3,86	3.87	decimal feet	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.95	3.90	4.28	4.14	4.06	4.07*	decimal feet	
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2.10	(†	his CE Concrete d	has blocks	of CR)	decimal feet	
Depth to Top of Sediment in CB	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.95	3,90	4,27	4.12	4,06	4,06	decimal feet	

October 2018 Data Collection Event

					Pag	e 1				
CB Cleaning Mont	n: October	Data Coll	ector Name:	Gordan Crane						
Dat	e: 10-24-18 Gleetisn	Data Coll	ection Time:		21 21	N				
Location (Circle One):		Test-Site	Control-Site						
Comments: Measured Sectiment	deaths 80-23-18									
" empty	(6-24-18		ч.			18				
Catch Basin #: 🔶	Depth Measurement	Location in CB:	,1	2	3	4	5	Avg	Units	
Depth of CB Empt	y: Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4,54	4,53	4.54	4.50	4.53	4.5.3	decimal feet	
Depth of CB Empty to Pipe Inve	t: of the inside of the pipe	D _{invert}	2.	35					decimal feet	
Depth to Top of Sediment in C	B: CB rim in 5 different locations in the CB	D _{CB-S}	4.50	4.50	4,46	4,43	4.53	4.49	decimal feet	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empt	y: Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	3.86	3.93	3.92	3.92	3,90	decimal feet	
Depth of CB Empty to Pipe Inve	t: Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2,	34	E,				decimal feet	
Depth to Top of Sediment in C	B: Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.84	3.9Z	3.89	3,85	3.05	3.85	decimal feet	
Catch Basin #: 🚬	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empt	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	437	4,33	4,35	4.37.	4.47	4,38	decimal feet	
Depth of CB Empty to Pipe Inve	t: Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	, 2	39		· (blob) Cont.)			decimal feet	
Depth to Top of Sediment in C	B: Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.30	4,31	4,35	4,37	4,44	435	decimal feet	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empt	Y: Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,93	3.93	3.92	3.93	3,94	3,93	decimal feet	
Depth of CB Empty to Pipe Inve	t: Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2	.33					decimal feet	
Depth to Top of Sediment in C	B: Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.82	5.34	2,90	3,85	3,31	3.86	decimal feet	

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CB Cleaning Month:	October	Data Col	lector Name:	Gordon Crane						
Date:	: 10-24-18 Collection	Data Col	lection Time:							
Location (Circle One):	:		Test-Site	(Control-Site)						
Comments:										
Catch Basin #: 5	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,81	3,79	3.82	5,84	3,81	3,81	decimal feet	
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2	.41					decimal feet	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.77	3.77	3.82	3.84	3.75	3,79	decimal feet	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.26	4.25	4.29	4.29	4.28	427	decimal feet	
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2	- 30					decimal feet	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.15	4.20	4.20	4.24	4,23	4.20	decimal feet	
Catch Basin #: 7	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	3.00	3,83	3.90	3,86	3.87	decimal feet	
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2,28					decimal feet	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3:76	3.75	3.84	3.86	3,96	3,81	decimal feet	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.95*	3.90*	4.28	4.14	4.06	4.07*	decimal feet	
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2.10	(* N (* CO	ote: this manager or	CB has n floor	olobs of of CB	decimal feet	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,93	3.88	A.20	4.12	4.05	4.04	decimal feet	

April 2019 Data Collection Event

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CB Cleaning Month	April 2019	019 Data Coll		C	Sordon	Cro	MC		
Date:	: 4-25-19 Collection	Data Coll	ection Time:						
Location (Circle One):			Test-Site)				
Comments: Measured sediment	depth 424-19					,			
Catch Basin #: 4	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4,54	4.53	4.54	4.53	4.53	4.53	decimal feet
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	12	2.35					decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.32	4,42	4,44	4.42	4,45	4.4	decimal feet
Catch Basin #:	Depth Measurement Location in CB:		1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,36	3,36	3.93	3.92	3,92	3,90	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	6	2,34		•			decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,75	3.73	3,77	3,80	3.77	3,77	decimal feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.37	4,33	4.35	4.37	4.47	4,38	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	r	2,39					decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.27	4,20	4.30	4.28	4.37	4.28	decimal feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,93	3,93	3.92	3,93	3.94	3,93	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2.23					decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.79	3.72	3.86	3.85	3.83	3,81	decimal feet

CB Cleaning Month: Data Collector Name: Gardon 2019 rave 9 Date: Data Collection Time: Location (Circle One): Test-Site **Control-Site** Comments: Measure Sed. 4-24-19 Catch Basin #: Depth Measurement Location in CB: 1 2 3 5 4 Avg Units Measure from the bottom of CB to CB rim decimal Depth of CB Empty DCB Z, 20 2 2 9 2 39 3 0 in 5 different locations in the CB feet Measure from the bottom o CB to bottom decimal Depth of CB Empty to Pipe Invert Z Dinvert of the inside of the pipe feet Measure from top of sediment in CB to decimal Depth to Top of Sediment in CB D_{CB-S} 45 56 55 3. 2 63 CB rim in 5 different locations in the CB feet Catch Basin #: **Depth Measurement Location in CB:** 2 3 1 4 5 Avg Units Measure from the bottom of CB to CB rim decimal Depth of CB Empty: D_{CB} 4.2 1 in 5 different locations in the CB feet Measure from the bottom o CB to bottom decimal Depth of CB Empty to Pipe Invert Dinvert 00 Lan of the inside of the pipe feet Measure from top of sediment in CB to decimal 4 Depth to Top of Sediment in CB: D_{CB-S} 4.0 2 ga 4.03 411 CB rim in 5 different locations in the CB feet Catch Basin #: **Depth Measurement Location in CB:** 1 2 3 4 5 Avg Units Measure from the bottom of CB to CB rim decimal Depth of CB Empty D_{CB} 3 98 90 2 80 2 9 2 in 5 different locations in the CB feet Measure from the bottom o CB to bottom decimal 80 Depth of CB Empty to Pipe Invert Dinvert of the inside of the pipe feet Measure from top of sediment in CB to decimal Depth to Top of Sediment in CB D_{CB-S} 3,57 3 3 2 AT Xa 20 1 CB rim in 5 different locations in the CB feet **Depth Measurement Location in CB:** 2 3 5 1 4 Units Catch Basin #: Avg Measure from the bottom of CB to CB rim decimal Depth of CB Empty: D_{CB} in 5 different locations in the CB feet decimal Measure from the bottom o CB to bottom has Depth of CB Empty to Pipe Invert Dinvert of the inside of the pipe au feet - derst Measure from top of sediment in CB to decimal Depth to Top of Sediment in CB D_{CB-S} 3 CB rim in 5 different locations in the CB feet

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June 2019 Data Collection Event

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CB Cleaning Month	: June 2019	Data Col	lector Name:	Gordon Crane						
Date:	· 7	Data Coll	ection Time:							
Location (Circle One)	:		Test-Site		3	\subset	Control-Site			
Note: Me	isured 6-21-99									
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.54	4.53	4.54	4,53	4,53	4.53	decimal feet	
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2,35	•	•	С ¹⁰		decimal feet	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4,50	4.51	4.54	4.52	453	4.52	decimal feet	
Catch Basin #: S	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	3,36	3.93	3.92	3,92	3.90	decimal feet	
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	-	2.34	×				decimal feet	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.86	3.26	3,90	3.90-	3.90	3.88	decimal feet	
Catch Basin #: 2	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.37	4.33	4.35	4.37	4.47	4.38	decimal feet	
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	-	2,39					decimal feet	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.37	4,33	4.35	4,37_	4.47	4.39	decimal feet	
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.93	3.73	3.92	3.93	3.94	3.93	decimal feet	
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2	2,23	v				decimal feet	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,93	3.93	3,90	3.91	3.94	3.92	decimal feet	

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CB Cleaning Months	June 2019	Data Col	lector Name:	Gordon Crane							
Date:	e: Data Collection Time:					And the second		n den son feld An Bern seiner fe	en antikar se beser		
Location (Circle One):		/	Test-Site	Control-Site							
Comments:											
Catch Basin #: 5	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	1	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,81	3.79	3.92	3,94	B.S.	3,81	decimal feet		
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2,.	=+	5				decimal feet		
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.77	3.77	3.81	3.82	3,77	3,79	decimal feet		
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	Transformation of the local division of the	
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4,26	4,28	4.29	4,29	4.28	4,27	decimal feet	*	
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	. 2	33.			3		decimal feet	T	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4,20	4.20	4,18	4.20	4,20	4.20	decimal feet		
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units	A DESCRIPTION OF THE OWNER OWNER OF THE OWNER OWNER OF THE OWNER OWNE	
ک Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3,86	3.86	3,93	3.90	3.96	3.87	decimal feet		
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	Z	28			(+)	r	decimal feet		
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.73	3.80	3.83	3.30	3.84	3,80	decimal feet		
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units		
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	*3.95	\$3.90	*4,28	4,14	*4,06	*4.07	decimal feet		
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2.1	0 \$(M	Jote: The Conr	is CR h	as blobs floor c	, FCB)	decimal feet	and the second second	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.93	3,88	4:26	4,16	4.05	4.06	decimal feet		

August 2019 Data Collection Event
	je Bi Bi				6 	, ,) g. (
CB Cleaning Month	Avaust Draig	Data Col	lector Name:		Fordon	Cipi	100		CID 8 10 12 10 12 10 12 10 12 10
Date	8-27	Data Coll	lection Time:		201001	<u> </u>	W.C		
Location (Circle One)	:		Test-Site	· · · · · · · · · · · · · · · · · · ·	a da serie		Control-Site)	
Comments:	Measured 8-27-19						The second s	<u> </u>	
Catch Basin #:	Depth Measurement	t Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.54	4.53	4.57	4.53	4,53	4.53	decimal feet
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	Measure from the bottom o CB to bottom D _{invert}		2.35				decimal feet	
Depth to Top of Sediment in CB	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.42	4,39	4,47	4,47	4.46	4,44	decimal feet
Catch Basin #:	Depth Measurement	t Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	5.36	3.93	3.92	3.92	3.90	decimal feet
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2.34					decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.03	3,80	3.89	3.86	3.85	3.85	decimal feet
Catch Basin #: 🛛 🖉	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.37	4.33	4.35	4.37	4.47	4.38	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2,39					decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.28	4.19	4.34	4,38	4.36	4.31	decimal feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.93	3.93	3.92	3.93	3.94	3.93	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	Dinvert	6	2,23					decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.80	3.83	3,89	3:66	3.86	3,85	decimal feet

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CD Cleaning Months		Data Colle	ector Name:	/	Sandon	Cin	NP		
CB Cleaning Month:	August aurg	Data Colli	ection Time:	<u>. </u>	JORAUN		V.C.		
Date:	r U	Data com	Tort Sito	·	5.5.5 Start		Control-Site		
Location (Circle One):			Test-site		1	()		·····	
Comments:	South side of	Road V	nae: (ot	s of	hay d	ebric)	both o	m	
	roadway. and i	~ 2 0		63 #-	7)				
Catch Basin #: 5	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.81	3.79	3.85.	3.94	3.05	3.82	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2,0	£1					decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3:75	3,78	3.83	.3.82	: 3.77	3.79	decimal feet
Catch Basin#:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.26	4,28	4.29	4,29	4.28	4.28	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	2,38					decimal feet	
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.13	4,21	4.26	4.24	4,19	4.21	decimal feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	3.86	3,93	3.90	3.86	3.87	decimal feet
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom	D _{invert} .	Z	28					decimal feet
Depth to Top of Sediment in CB	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,76	3.80	3.84	.3.84	. 3.80	3.81	decimal feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	\$.95	3.90	\$4,28	P. 14	4.06	4.07	feet
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom	D _{invert}	2.	10 *(1	Jote: The Con	is OB /	has blobs - floor i	PTCR)	feet
Depth to Top of Sediment in CB	Measure from top of sediment in CB to	D _{CB-S}	3.89	3.88	4,23	4.10	4,60	4.02	feet

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October 2019 Data Collection Event

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CB Cleaning Mont	" October 2019	Data Coll	ector Name:	Ċ	Sordon	Cra	NC		
Data	: 10-29-19	Data Coll	ection Time:		9 9			、 、	
Location (Circle One):		Test-Site	×.	a si	\subset	Control-Site)	
Comments: Collection	10-30-19	a					NT 97 particular de la Construction de la Construcción de la Construcción de la Construcción de la Constru		
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empt	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.54	4.53	4.54	4.53	4,53	4.53	decimal feet
Depth of CB Empty to Pipe Inver	t: Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2,35	•		•		decimal feet
Depth to Top of Sediment in C	B: Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4,50	4.52	4,51	4,51	4.52	4,51	decimal feet
Catch Basin #: 🧠	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empt	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	5.36	3.93	3.92	3.92	3.90	decimal feet
Depth of CB Empty to Pipe Inver	t: Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}		2.34	.02	aG(decimal feet
Depth to Top of Sediment in C	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3,85	305	3.91	3.91	3,91	3.89	decimal feet
Catch Basin #: 🛛 📿	Depth Measurement	Location in CB:	1	2	3	. 4	5	Avg	Units
Depth of CB Empt	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.37	4.33	4.35	4.37	4:47	:438	decimal feet
Depth of CB Empty to Pipe Inve	t: Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	6	2,3.9.04	10	,02	,02		decimal feet
Depth to Top of Sediment in C	3: Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4.36	4:29	4.34	. 4.35	. 4,45	4,36	feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empt	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.93	3.93	3.92	3.93	3.94	3.93	feet
Depth of CB Empty to Pipe Inve	Measure from the bottom o CB to bottom t: of the inside of the pipe	Dinvert	.62	2,23.04	. 02	. 62	. Ól		feet
Depth to Top of Sediment in C	Measure from top of sediment in CB to	D _{CB-S}	3.91	3.89	3,90	3.91	3.93	. 3.91	decimal feet

			-			F	2.2		
CB Cleaning Month:	October 2019	Data Col	lector Name:	6	ridan (FAILE	a de la companya de l La companya de la comp		
Date:	10-29-19	Data Col	lection Time:						
Location (Circle One):		· · ·	Test-Site		n at a		Control-Site		
Comments:		(-				
· · · · · · · · · · · · · · · · · · ·		T	8		Ter s	n a			
Catch Basin #: 5	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.81	3.79	3.82	3.94	3.8(3.81	decimal feet
Depth of CB Empty to Pipe Invert	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	10' Z,	£1,02	, G2	.03	0		decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.71	3.77	3,80_	3.87	3,80	3,79	decimal feet
Catch Basin #:	Depth Measurement	Location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	4.26	4,25	4.29	4,29	4.28	4.27	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert}	10 ¹ .2	38,05	.Do	.06	.05		decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	4,16	4,20	4.23	4.23	4,23	4,21	decimal feet
Catch Basin #:	Depth Measurement I	Location in CB:	1	2	3	4 :	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	3.86	3.86	3,83	3.90	3.86	3.87	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	D _{invert} .	. 152 Z	23,10	,03	. 08	,04		decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.84	3.76	3,85	. 3,82	3.82	3,82	decimal feet
Catch Basin #:	Depth Measurement I	location in CB:	1	2	3	4	5	Avg	Units
Depth of CB Empty:	Measure from the bottom of CB to CB rim in 5 different locations in the CB	D _{CB}	\$.95	3.90	4,28	7.14	4.06	\$4.07	decimal feet
Depth of CB Empty to Pipe Invert:	Measure from the bottom o CB to bottom of the inside of the pipe	Dinvert	.032.0	0.03 (M	Jote: The	is CE h	as plobs	FCR)	decimal feet
Depth to Top of Sediment in CB:	Measure from top of sediment in CB to CB rim in 5 different locations in the CB	D _{CB-S}	3.92	3.87	4,22	4,08	4.04	4.03	decimal feet
				(a) 2					
								94 (14	

Appendix E Sump Sock Tare Weights Raw Data

April 2018 Data Collection Event

Date:	4-	-20-18		Data Collection Time:	*****	
Location (Circle One):		Test-Site		Conti	rol-Site	
Comments: Socks placed	offer	cleans/su	veep			
Catch Basin #:	4					
Any holes or tears present in used sock?	1	Describe damage:				1
Used Sock Removed?		Sock Label:	The second s	and the second se	200 M	
Used Sock Shipping Prep	Used	Sock Sealed?		Used Sock Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled?		Bag Label:			and the second design of the s	
New Sock Weighed Pre-Install?	2	Weight:		280	poun	ts 91
New Sock Installed and Labeled?		Sock Label:	Test	CB #4		
conneurs.	1.1.1 <u>.1.</u> 1.1.1.1.1					1.0000000
Catch Basin #:	3					
Any holes or tears present in used sock?		Describe damage:			and the second	ليوي ورون ورون ورون ورون ورون ورون ورون و
Used Sock Removed?	0	Sock Label:	And all all all all all all all all all al	and and the second se		
Used Sock Shipping Prep	Used	Sock Sealed?		Used Sock Placed in	Plastic Bag?	
	22264	Pag Labal			A REAL PROPERTY OF A REAL PROPER	Contamination of the local division of the l
Used Sock Plastic Bag Labeled?		Dag Label.	-1.50/1012			1910
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install?		Weight:		282	Dohu	dsgr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments:		Sock Label:	Te	282 st (B # 3	Dohu	dsgr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #:	2	Weight: Sock Label:	Te	282 et (B#3	Dofin	ds gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock?		Describe damage:	Te	282 est (B # 3	рдия	dsgr.
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed?		Describe damage: Sock Label:	Te	282 et (B#3	Dofiu	ds gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep		Describe damage: Sock Label: Sock Label: Sock Label:	Te	282 st (B # 3 Used Sock-Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?	C C C C Used	Describe damage: Sock Label: Sock Label: Sock Label: Bag Label: Bag Label:	Te	282 est (B # 3 Used Sock Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install?		Describe damage: Sock Label: Sock Label: Sock Label: Sock Sealed? Bag Label: Weight:	Te	282 ost (B # 3 Used Sock-Placed in 278	Plastic Bag?	ds gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled?		Describe damage: Sock Label: Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label:	Te	282 est (B # 3 Used Sock Placed in 278 est CB # Z	Plastic Bag?	ds gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments:		Describe damage: Sock Label: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label:	Te De Te	282 est (B # 3 Used Sock-Placed in 278 est CB # Z	Plastic Bag?	ds gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments:		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label:	7e	282 st (B # 3 Used Sock Placed in 278 st CB # Z	Plastic Bag?	is gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock?		Describe damage: Sock Label: Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Ock Label: Describe damage:	Te	282 rst (B # 3) Used Sock-Placed in 278 rst CB # Z	Plastic Bag?	ds gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed?		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Describe damage: Sock Label:	7e	282 st (B # 3 Used Sock Placed in 278 st CB # Z	Plastic Bag?	ds gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Removed?		Describe damage: Sock Label: Describe damage: Sock Label: Bag Label: Weight: Sock Sealed? Describe damage: Sock Label: Sock Label: Sock Label:	7e	282 st (B # 3 Used Sock-Placed in 278 st CB # Z Used Sock Placed in	Plastic Bag? Plastic Bag?	ds gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Shipping Prep Used Sock Shipping Prep Used Sock Shipping Prep Used Sock Plastic Bag Labeled?		Describe damage: Sock Label: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Describe damage: Sock Label: Sock Label: Bag Label:	7e 7e 7e	282 st (B # 3 Used Sock Placed in 278 st CB # Z	Plastic Bag?	ds gr
Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Removed? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install?		Describe damage: Sock Label: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Describe damage: Sock Label: Sock Label: Sock Label: Sock Sealed? Describe damage: Sock Label: Weight:	7e	282 st (B # 3 Used Sock Placed in 278 st CB # Z Used Sock Placed in 276	Plastic Bag? Plastic Bag? Plastic Bag?	ds gr,

Sump Sock Sediment Collection and Dry Weight Analysis Field Data Collection Form

Date:	4-2	20-18]	Data Collection Time:		
Location (Circle One):		Test-Site		Control-Site		
Comments: Socks placed a	after	clean/s	weep			
Catch Basin #:	5					
Any holes or tears present in used sock?		Describe damage:				and the second
Used Sock Removed?		Sock Label:			and the second	
Used Sock Shipping Prep	Used	I Sock Sealed?		Used Sock Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled?		Bag Label:			Construction of the local distance of the lo	
New Sock Weighed Pre-Install?		Weight:		230	pound	sqr.
New Sock Installed and Labeled?		Sock Label:	Ce	introl CB	5	5
олшихихэ.	1					
Catch Basin #:	6		(1))))))))			
Any holes or tears present in used sock?		Describe damage:				
Used Sock Removed?		Sock Label:	>			
Used Sock Shipping Prep	Usec	I Sock Sealed?		Used Sock Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled?		Bag Label:		222		
New Sock Weighed Pre-Install?		Weight:		282	pound	Is GI
New Sock Installed and Labeled?		Sock Label:	C	ontrol CB	6	
Catch Basin #:	7	.				
Any noies or tears present in used sock?		Describe damage:				
Used Sock Removed?		Sock Label:	<u> </u>			
Used Sock Shipping Prep	Usec	1 Sock Sealed?		Used Sock Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled?		Bag Label:		000		
New Sock Weighed Pre-Install?	U	Weight:	04	420	pound	15 JI
New Sock Installed and Labeled?		Sock Label:	Contr	rol CB /		
Catch Basin #:	3	(No	So	d c		
Any holes or tears present in used sock?		Describe damage:				
Used Sock Removed?		Sock Label:		~ /		
Used Sock Shipping Prep	Used	1 Sock Sealed?		Used Sock Placed in	Plastic Bag?	۵
Used Sock Plastic Bag Labeled?		Bag Label:	2			-
New Sock Weighed Pre-Install?		Weight:		\bigvee	poun	ds
New Sock Installed and Labeled?		Sock Label:		$\langle \rangle$		
Comments:		1	. /			

Sump Sock Sediment Collection and Dry Weight Analysis Field Data Collection Form

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June 2018 Data Collection Event

Sump Sock Sediment Collection	on and	Dry Weight A	nalysis Field Data Collection Form	-
CB Cleaning Month: Date:	20	NC 19-18	Data Collector Name: Cordon	_
Location (Circle One):		Test-Site)	Control-Site	
Comments: Dirty sock	s, pl	aced afte	r 4-20-18 superficien	Tg. 1
Catch Basin #.	4			
Any holes or tears present in used sock?		Describe damage:	None]
Used Sock Removed?	đ	Sock Label:	Test CB # 4	
Used Sock Shipping Prep	Usec	I Sock Sealed?	Used Sock Placed in Plastic Bag?	
Used Sock Plastic Bag Labeled?	⊠∕	Bag Label:	Test CB#4	
New Sock Weighed Pre-Install?	٢	Weight:	Z82 Gr. pounds gr	Néw Socks
New Sock Installed and Labeled?	Q/	Sock Label:	Test CB #4	6-19-18
Comments:				
Catch Basin #:				
Any holes or tears present in used sock?	۵	Describe damage:	-	
Used Sock Removed?	Ø	Sock Label:	Test CB #3	
Used Sock Shipping Prep	Used	1 Sock Sealed?	Used Sock Placed in Plastic Bag?	
Used Sock Plastic Bag Labeled?	ø	Bag Label:	Test CB #3	
New Sock Weighed Pre-Install?	P _	Weight:	278 GIV. poundsgr.	(New Sack)
New Sock Installed and Labeled?	Ū.	Sock Label:	Tost CR 13	
Comments:			т. Т	
Catch Basin #:	2			
Any holes or tears present in used sock?		Describe damage:		
Used Sock Removed?	Ø	Sock Label:	Test CB #2	
Used Sock Shipping Prep	Usec	l Sock Sealed?	Used Sock Placed in Plastic Bag?	1
Used Sock Plastic Bag Labeled?	Ø	Bag Label:	Test CB #2	
New Sock Weighed Pre-Install?	Ø	Weight:	290 gr. pounds gr.	New
New Sock Installed and Labeled?	ø	Sock Label:	Test CB # 2	
Comments:		*) 53	<i>2</i>	
Catch Basin #:	- /			
Any holes or tears present in used sock?	ū	Describe damage:		
Used Sock Removed?	6	Sock Label:	Test CB# 1	-
Used Sock Shipping Prep	Used	1 Sock Sealed?	Used Sock Placed in Plastic Bag?	
Used Sock Plastic Bag Labeled?	ø	Bag Label:	Tet CB #-1	
New Sock Weighed Pre-Install?	Q	Weight:	274 gr, poundsgr	New
New Sock Installed and Labeled?	p	Sock Label:	Test CB#1	
Comments:	i j			

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Sump Sock Sediment Collection	on and	Dry Weight A	nalysis Field Data Colle	ection Form	
CB Cleaning Month:	Ę	The	Data Collector Name:	Gordon	
Location (Circle One):	. (2	Test-Site		ol-Site	$D \sim$
Comments: Dirty sacks	plac	ed after	4-20-13 Swee	opsiclean	Now Socks
Catch Basin #:	5			$\frac{1}{2} \frac{1}{2} \frac{1}$	
Any holes or tears present in used sock?		Describe damage:			
Used Sock Removed?	Ø	Sock Label:	Control CB:	#5	
Used Sock Shipping Prep	Usec	I Sock Sealed?	□- Used Sock Placed in I	Plastic Bag?	
Used Sock Plastic Bag Labeled?	đ	Bag Label:	Control CB#	5	75
New Sock Weighed Pre-Install?	Ø	Weight:	270 gr.	pounds	New Socks
New Sock Installed and Labeled?	ø	Sock Label:	Control CB #	15	6-19-18
Comments:					
52					
Catch Basin #.	6				
Any holes or tears present in used sock?	۵	Describe damage:		1	ii.
Used Sock Removed?	Ø	Sock Label:	Control CB	#6	
Used Sock Shipping Prep	Usec	I Sock Sealed?	□ Used Sock Placed in 1	Plastic Bag?	
Used Sock Plastic Bag Labeled?	,Ø-	Bag Label:	Control CB	tt 6	
New Sock Weighed Pre-Install?	Ø	Weight:	270 gr	pounds	
New Sock Installed and Labeled?	Ø	Sock Label:	Control CB	#6	
Comments:					a.
Catch Basin #:	7				
Any holes or tears present in used sock?		Describe damage:			
Used Sock Removed?	Ø	Sock Label:	Control CB+	17	
Used Sock Shipping Prep	Usec	l Sock Sealed?	□ Used Sock Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled?	6	Bag Label:	Control CB	#7	
New Sock Weighed Pre-Install?	6	Weight:	272 21.	pounds	
New Sock Installed and Labeled?	6	Sock Label:	Control CB	#7	
Comments:	2		-		
Catch Basin #:	8	×	ENO SO	che this	CB *
Any holes or tears present in used sock?		Describe damage:	· ·		
Used Sock Removed?		Sock Label:		<u> </u>	
Used Sock Shipping Prep	Used	1 Sock Sealed?	Used-Sock Placed in	Plastic Bag?	-
Used Sock Plastic Bag Labeled?		Bag Label;			1
New Sock Weighed Pre-Install?	D	Weight:		pounds	
New Sock Installed and Labeled?		Sock Label:			
Comments:			· · · · · · · · · · · · · · · · · · ·	<	- 121
1		8			

3/1/2018

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August 2018 Data Collection Event

CB Cleaning Month: Date: Location (Circle One): Comments: CB & cleaned 8 - Catch Basin #: Any holes or tears present in used sock? Used Sock Removed?	40 8-23 22 -	9 UST 2018 2 18 (Test-Site) 18]	Data Collector Name: Data Collection Time: Contr	Gordon ol-Site	Crave
Location (Circle One): Comments: CBE cleaned 8- Catch Basin #: Any holes or tears present in used sock? Used Sock Removed?	22-	Test-Site		Contr	ol-Site	
Catch Basin #: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed?	22-	18				
Catch Basin #: Any holes or tears present in used sock? Used Sock Removed?						
Any holes or tears present in used sock? Used Sock Removed?	and the second second			a da anti da anti angla angla angla ang Angla angla		19782 (1985) 1977 - 1974
Used Sock Removed?		Describe damage:				
A 4	ซ	Sock Label:	Test	-CB#4		
Used Sock Shipping Prep	Used	Sock Sealed?	U	Used Sock Placed in I	Plastic Bag?	D /
Used Sock Plastic Bag Labeled?	ø	Bag Label:	Test	-CB#4		
New Sock Weighed Pre-Install?	ø	Weight:	2	182Gr.	pound	ls
New Sock Installed and Labeled?	ø	Sock Label:	Test	- CB#4	2 ⁴	· · ·
Comments:						
Catch Basin #.	3		to da Ka Galekar			
Any holes or tears present in used sock?		Describe damage:		And a second	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.
Used Sock Removed?	ď	Sock Label:	Test	CB#3		49 2010-20
Used Sock Shipping Prep	Used Sock Sealed?			Used Sock Placed in I	Plastic Bag?	D
Used Sock Plastic Bag Labeled?	۵j/	Bag Label:	Tes	t CB # 3	14. 14.	
New Sock Weighed Pre-Install?	D⁄	Weight:	2	80 Gr.	poun	ds
New Sock Installed and Labeled?	6	Sock Label:	Test	CBHZ		
Comments:			87			
Catch Basin #:	2					
Any holes or tears present in used sock?		Describe damage:				
Used Sock Removed?		Sock Label:	Te	st-CB#2	2	
Used Sock Shipping Prep	Used	Sock Sealed?		Used Sock Placed in	Plastic Bag?	۵
Used Sock Plastic Bag Labeled?	0-	Bag Label:	Tes	ST CB #	2	
New Sock Weighed Pre-Install?	0-	Weight:	2	184-Gr.	poun	ds
New Sock Installed and Labeled?	0	Sock Label:	Te	stCB #2		
Comments:		с. С				
Catch Basin #:	1			n finn an star Chailtean Ann an star		
Any holes or tears present in used sock?	D	Describe damage:				
Used Sock Removed?	6	Sock Label:	Ter	st CB #	(
Used Sock Shipping Prep	Used	Sock Sealed?		Used Sock Placed in	Plastic Bag?	۵
Used Sock Plastic Bag Labeled?	0-	Bag Label:	16	25 CB \$	51	
	P	Weight:	. 7	'80 Gr.	pour	ıds
New Sock Weighed Pre-Install?			No.	1		
New Sock Weighed Pre-Install? New Sock Installed and Labeled?	6	Sock Label:	le	ST.CE #1		

Vg. 1 New socks 8-23-18

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Sump Sock Sediment Collection	on and .	Dry Weight A	nalysis Field Data Collection Form	-
CB Cleaning Month; Date:	8-2	5-13	Data Collector Name: Data Collection Time:	-
Location (Circle One):		Test-Site	Control-Site	
Comments: CB's cleaved	l 8	3-22-(8		tg. 2
Catch Basin #:	Č,			pau ac
Any holes or tears present in used sock?		Describe damage:		8-23-18
Used Sock Removed?	,D-	Sock Label:	Control CB#5	
Used Sock Shipping Prep	Used	Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	1
Used Sock Plastic Bag Labeled?	P	Bag Label:	Control CB#5	
New Sock Weighed Pre-Install?	₽×	Weight:	280 Gr, pounds	
New Sock Installed and Labeled?	" .	Sock Label:	Control CB # 5]
Comments:				
Catch Basin #:	6			
Any holes or tears present in used sock?		Describe damage:		17
Used Sock Removed?	- marine	Sock Label:	Control (E#6	
Used Sock Shipping Prep	Used	Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?	đ	Bag Label:	Control CB#1:	
New Sock Weighed Pre-Install?	2	Weight:	282 Gr. pounds	
New Sock Installed and Labeled?	ø	Sock Label:	Control (B:#6	
Comments:		•		
Catch Basin #:				
Any holes or tears present in used sock?		Describe damage:	5-	
Used Sock Removed?	⊡‴	Sock Label:	Control CB #7	
Used Sock Shipping Prep	Used	Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?	0~	Bag Label:	Control CB#7	
New Sock Weighed Pre-Install?	đ	Weight:	280 Gr. pounds	
New Sock Installed and Labeled?	Æ	Sock Label:	Control CB#7	
Comments:				
Catch Basin #:	8	* No	Sock this CBA	
Any holes or tears present in used sock?	۵	Describe damage:		
Used Sock Removed?	. 🗆	Sock Label:		
Used Sock Shipping Prep	Used	Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?		Bag Label:		
New Sock Weighed Pre-Install?	. 🗆	Weight:	pounds	
New Sock Installed and Labeled?		Sock Label:		, ÷ ,
Comments:	* 2 2			

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October 2018 Data Collection Event

Jump Sock Scarment Concern	0	I al a m		101
CB Cleaning Month: Date:	10-	24-18	Data Collector Name: Controlom Data Collection Time:	- Trave
Location (Circle One):		(Test-Site)	Control-Site	
Comments:		\smile		1
				1.000
Catch Basin #:		4		
Any holes or tears present in used sock?		Describe damage:	Nore	
Used Sock Removed?	D	Sock Label:	Test CB #4	
Used Sock Shipping Prep	Used	1 Sock Sealed?	□ Used Sock Placed in Plastic Bag?	
Used Sock Plastic Bag Labeled?	Ø	Bag Label:	Test CB#4	
New Sock Weighed Pre-Install?	ø	Weight:	288 Gr pounds	Gr
New Sock Installed and Labeled?		Sock Label:	Test CBAA	
Comments:			and the second	
Catch Basin #:	10 10 10	R S	an a	
Any holes or tears present in used sock?		Describe damage:	How	unter Mitte
Used Sock Removed?	Ø	Sock Label:	Test CR # 3	
Used Sock Shipping Prep	Used	d Sock Sealed?	Used Sock Placed in Plastic Bag?	
Used Sock Plastic Bag Labeled?	đ	Bag Label:	Tret CR A 2	
New Sock Weighed Pre-Install?		Weight:	278 GC pounds	/
New Sock Installed and Labeled?		Sock Label:		
Comments:		<u> </u>		
8 25		21 2	2 5	
Catch Basin #:		9		
Any holes or tears present in used sock?		Describe damage:	Atome -	240.22.243.43.43
Used Sock Removed?	10	Sock Label;	Test CB #2	
Used Sock Shipping Prep	Used	d Sock Sealed?	Used Sock Placed in Plastic Bag?	
Used Sock Plastic Bag Labeled?	Q	Bag Label:	Trect OR #2	
New Sock Weighed Pre-Install?	G	Weight:	284 Gr pounds	
New Sock Installed and Labeled?	6	Sock Label:	Tect (2#2	
Commenter.	L		100 -110	1
Comments:				
Comments:		8		
Comments: Catch Basin #: 1		1		
Comments: Catch Basin #: Any holes or tears present in used sock?		1 Describe damage	: Nove	
Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed?		Describe damage:	Noxe Tot (D # 1	
Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed?		Describe damage: Sock Label:	Test CB # 1	· · · · · · · · · · · · · · · · · · ·
Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep	Used	Describe damage: Sock Label: 1 Sock Sealed?	None Test CB # 1 Used Sock Placed in Plastic Bag?	
Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?	Used	Describe damage: Sock Label: d Sock Sealed? Bag Label:	$\frac{1}{10000000000000000000000000000000000$	· · ·
Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install?		1 Describe damage: Sock Label: d Sock Sealed? Bag Label: Weight:	None Test CB # 1 Used Sock Placed in Plastic Bag? Test CB # 1 296 Gr. pounds	· · ·
Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled?	Used p p	Describe damage: Sock Label: d Sock Sealed? Bag Label: Weight: Sock Label:	None Test CB $\# 1$ Used Sock Placed in Plastic Bag? Test CB $\# 1$ 296 Gr pounds Test CB $\# 1$	· · ·

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Sump Sock Sediment Collection	on and	Dry Weight A	nalysis Field Data Collection Form	
CB Cleaning Month:	C	ctober.	Data Collector Name: Geordon Crave	
Location (Circle One):	10-	Test-Site	Control-Site)	
Comments:			Pag	Ċ
Catch Basin #:	5	÷.		
Any holes or tears present in used sock?		Describe damage:	None	
Used Sock Removed?	₽-	Sock Label:	Control CB#5	
Used Sock Shipping Prep	Use	d Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?	Ø	Bag Label:	Control CB #5.	
New Sock Weighed Pre-Install?	Ø	Weight:	278 Gr, pounds	
New Sock Installed and Labeled?	Ø	Sock Label:	Control CB #5	
Comments:		10 August 10		
Catch Basin #:	1	0		
Any holes or tears present in used sock?		Describe damage:	None.	
Used Sock Removed?	Ø	Sock Label:	Control CR #6	
Used Sock Shipping Prep	Use	d Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?	đ	Bag Label:	Control CR42	
New Sock Weighed Pre-Install?	Ø	Weight:	236, Gr portudes	
New Sock Installed and Labeled?	P	Sock Label:	Control CR#6	
Comments:	5000			
Catch Basin #:		7		
Any holes or tears present in used sock?		Describe damage:	None -	
Used Sock Removed?	ĺ۵	Sock Label:	Control CIB#7	
Used Sock Shipping Prep	Used	d Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?	ø	Bag Label:	Control CIE#7	
New Sock Weighed Pre-Install?	,Ø~	Weight:	276 Gr. pounds	
New Sock Installed and Labeled?	۵	Sock Label:	Control CB #7	
Comments:		α,		
Catch Basin #.	~ 8	3-KNG	Sock this CB-+	
Any holes or tears present in used sock?		Describe damage:	. A grand and a state of the	
Used Sock Removed?	. 🗆	Sock Label:	and the second se	
Used Sock Shipping Prep	Use	1 Sock Sealed?	Used Sock Placed in Plastic Bag?	
Used Sock Plastic Bag Labeled?		Bag Label:	and the second se	
New Sock Weighed Pre-Install?		Weight:	pounds	
New Sock Installed and Labeled?	رب ا	Sock Label:		
Comments:				

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April 2019 Data Collection Event

Date: Location (Circle One): Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?		Test-Site	Data Collection Time: Control-Site	<u> </u>
Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?	Used	Describe damage?		
Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?	U U Used	Describe damage?		
Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?	U Used	Describe damage?		
Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?	U Used	0.1711		
Used Sock Shipping Prep Used Sock Plastic Bag Labeled?	Used	Sock Label:	Control CB#4	All Socks
Used Sock Plastic Bag Labeled?		l Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	OK, pla
		Bag Label:	Control CB #4	bag labele
New Sock Weighed Pre-Install?		Weight:	274 Gr. pounds	
New Sock Installed and Labeled?		Sock Label:	Control CB#4	
comments:		· · · · · ·		
Catch Basin #:		8		V
Any holes or tears present in used sock?		Describe damage:		
Used Sock Removed?		Sock Label:	Control CB#3	
Used Sock Shipping Prep	Used	l Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?	Ľ	Bag Label:	Control CE#3	
New Sock Weighed Pre-Install?		Weight:	268 gr. pounds	-
New Sock Installed and Labeled?		Sock Label:	Control CB#3	
comments: Catch Basin #:		2		
Any holes or tears present in used sock?		Describe damage:	n yan dan da kana da k Na kana da kana	
Used Sock Removed?		Sock Label;	Control CPS #2	
Used Sock Shipping Prep	Use	l Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?		Bag Label:	Control CR #2	
New Sock Weighed Pre-Install?		Weight:	270 Gr. politids	
New Sock Installed and Labeled?		Sock Label:	Control CR #2	
Comments:		•		
Catch Basin #:		1		
Any holes or tears present in used sock?	D	Describe damage:		
Used Sock Removed?		Sock Label:	Control CB #1 .	
Used Sock Shipping Prep	Use	1 Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?		Bag Label:	Control CE#1] .
New Sock Weighed Pre-Install?	. 🗆	Weight:	272GT pounds	
New Sock Installed and Labeled?		Sock Label:	Catrol (E #1	
Comments:	6 <u>.</u>	·		

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CB Cleaning Month:	Apr	11 2019	Data Collector Name:
Location (Circle One):	4-	Test-Site	Data Collection Time:
mments:			
Catch Basin #:-		Annual Contraction of the Contra	
Any holes or tears present in used sock?		Describe damage:) < All socks OK
Used Sock Removed?		Sock Label:	Fet (B#5
Used Sock Shipping Prep	Use	d Sock Sealed?	□ Used Sock Placed in Plastic Bag? □
Used Sock Plastic Bag Labeled?		Bag Label:	Test CB#5
New Sock Weighed Pre-Install?		Weight:	272 GI poundes
New Sock Installed and Labeled?	D	Sock Label:	Test CE#5
omments:			an ann ann Aireannaichte ann an Tha 1977 ann an Nel
ж 4			
Catch Basin #:		6	
Any holes or tears present in used sock?		Describe damage:	
Used Sock Removed?		Sock Label:	Test CB#6
Used Sock Shipping Prep	Use	d Sock Sealed?	□ Used Sock Placed in Plastic Bag? □
Used Sock Plastic Bag Labeled?	۵	Bag Label:	Test CB#6
New Sock Weighed Pre-Install?		Weight:	274 Gr. points
New Sock Installed and Labeled?		Sock Label:	Test CB # 6
omments:			
с. Х			
Catch Basin #:		7	
Any holes or tears present in used sock?		Describe damage:	-
Used Sock Removed?		Sock Label:	Test CB#7
Used Sock Shipping Prep	Use	d Sock Sealed?	□ Used Sock Placed in Plastic Bag? □
Used Sock Plastic Bag Labeled?		Bag Label:	Test CE#7
New Sock Weighed Pre-Install?		Weight:	272 Gr. pounds
New Sock Installed and Labeled?		Sock Label:	Test CEAT
omments:			/
Catch Basin #:		8	No Sock this CB
Any holes or tears present in used sock?		Describe damage:	
COMPANY OF THE OWNER		Sock Label:	
Used Sock Removed?	Use	d Sock Sealed?	□ Used Sock Placed in Plastic Bag? □
Used Sock Removed? Used Sock Shipping Prep			
Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?	0	Bag Label:	
Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install?		Bag Label: Weight:	pounds

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June 2019 Data Collection Event

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CB Cleaning Month:	Jun	e 2019		Data Collector Name:	Geordon	Fane
Date:	6	-24-19)	Data Collection Time:	2	
Location (Circle One):		Test-Site		Contr	ol-Site	
Catch Basin #:	4					
Any holes or tears present in used sock?		Describe damage:				
Used Sock Removed?		Sock Label:	Co	ntrol CB	#4	
Used Sock Shipping Prep	Usec	l Sock Sealed?		Used Sock Placed in I	Plastic Bag?	
Used Sock Plastic Bag Labeled?		Bag Label:	Cor	trol CB	# 1	
New Sock Weighed Pre-Install?		Weight:		276	pounds	95
New Sock Installed and Labeled?		Sock Label:	C	introl CB	#4	Q.
Comments:						
Catch Basin #:	B		$\left\{ \begin{array}{c} 1 & 1 \\ 1 & 1 \\ 2 & 1 \\ 3 & 1 \\ 3 & 1 \\ 3 & 1 \\ 3 & 1 \end{array} \right\}$			
Any holes or tears present in used sock?		Describe damage:				
Used Sock Removed?	D	Sock Label:	Ca	that CB	# 3	
Used Sock Shipping Prep	Used	l Sock Sealed?	۵	Used Sock Placed in 1	Plastic Bag?	
Used Sock Plastic Bag Labeled?	۵	Bag Label:	C	ontvol CR	6 # 3	
New Sock Weighed Pre-Install?		Weight:	1	272	poinds	ar
New Sock Installed and Labeled?		Sock Label:	Co	ntral CR	#3	0
Comments:			.			
Catch Basin #:	2					
Any holes or tears present in used sock?		Describe damage:			-	
Used Sock Removed?		Sock Label:	Co	MTOICE	#2	
Used Sock Shipping Prep	Used	l Sock Sealed?		Used Sock Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled?		Bag Label:	Co	MTRO (CR	H2	
New Sock Weighed Pre-Install?	D	Weight:		278	pounds	.gr
New Sock Installed and Labeled?		Sock Label:	Co	as lotta	#2	~
Comments:		ł				
Catch Basin #:	1			alay na sana sana sana sana sana sana sana		
Any holes or tears present in used sock?	0	Describe damage:	:			
Used Sock Removed?	. 🗆	Sock Label:	. Co	ATTOI CE	. 壮(
Used Sock Shipping Prep	Used	I Sock Sealed?		Used Sock Placed in	Plastic Bag?	0
Used Sock Plastic Bag Labeled?		Bag Label:	G	introl CE	2∉1	
New Sock Weighed Pre-Install?	. 🗆	Weight:		274	pound	95
New Sock Installed and Labeled?	0	Sock Label:	C	antrol ()	ZH1	
Comments:			: ;	······		ĵ
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Sump Sock Sediment Collection	on and	Dry Weight A	nalysis Field Data Coll	ection Form	-
CB Cleaning Month:	JUN	<u>2019</u>	Data Collector Name:	Gordon Cran	<u>e</u> (
Location (Circle One):		(Test-Site)	Conti	rol-Site	
Comments:					Page 2
Catch Basin #:	Ż	5			
Any holes or tears present in used sock?		Describe damage:			
Used Sock Removed?		Sock Label:	Test CB #	5	
Used Sock Shipping Prep	Used	d Sock Sealed?	Used Sock Placed in 1	Plastic Bag? 🛛	
Used Sock Plastic Bag Labeled?		Bag Label:	Test CB #	5	
New Sock Weighed Pre-Install?		Weight:	182	pounds Gu	
New Sock Installed and Labeled?		Sock Label:	Test CB #	# 5	
Comments: Catch Basin #:		6		Manual Angeles	
Any holes or tears present in used sock?		Describe damage:			
Used Sock Removed?		Sock Label:	Test CB :	H-6	
Used Sock Shipping Prep	Used	d Sock Sealed?	Used Sock Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled?	D	Bag Label:	Test CB #	4	1/
New Sock Weighed Pre-Install?		Weight:	276	pounds Gr	1/
New Sock Installed and Labeled?		Sock Label:	Test CE &	±6	-
Comments:		ň			
Catch Basin #:		7			
Any holes or tears present in used sock?		Describe damage:		-	
Used Sock Removed?	ū	Sock Label:	Test CB #	7	
Used Sock Shipping Prep	Used	d Sock Sealed?	□ Used Sock Placed in	Plastic Bag?	
Used Sock Plastic Bag Labeled?		Bag Label:	Test CE #	£ 7	e Note: Manutacturer
New Sock Weighed Pre-Install?	D	Weight:	176	poundsGr	switched to lighter we
New Sock Installed and Labeled?		Sock Label:	Test CE	# 7	tabric
Comments:		No Soci	e this CB	6	
Catch Basin #:	8	an a			
Any holes or tears present in used sock?	* 0	Describe damage:		Second State St	
Used Sock Removed?		Sock Label:			
Used Sock Shipping Prep	Used	1 Sock Sealed?	Used Sock Placed in	Plastic Bag?	1
Used Sock Plastic Bag Labeled?		Bag Label:			
New Sock Weighed Pre-Install?	. 🗆	Weight		pounds	-
New Sock Installed and Labeled?	•	Sock Label:	1 -		
Comments:	е <mark>же</mark> 8				

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August 2019 Data Collection Event

STREET SWEEPING AND CATCH BASIN CLEANING COMPARISON

		Augu	st 2019	\bigcap
Sump Sock Sediment Collection	on and	Dry Weight A	nalysis Field Data Collection Form	
CB Cleaning Month:	Avgi	1st 2019	Data Collector Name: Gordon Crane_	lage
Location (Circle One):	8	Test-Site	Data Collection Time:	.0
Comments:	-			and the second s
				10
Catch Basin∦.	4			switched
Any holes or tears present in used sock?		Describe damage:	· /	1 1
Used Sock Removed?		Sock Label:	Control CB # 4	sent off
Used Sock Shipping Prep	Use	d Sock Sealed?	Used Sock Placed in Plastic Bag?	0 50 10
Used Sock Plastic Bag Labeled?		Bag Label:	Control CB # 4	3-29-17
New Sock Weighed Pre-Install?	a	Weight:	174 pounds ar	1
New Sock Installed and Labeled?		Sock Label:	Control CR # 4	
Comments:				
Catch Basin #-	B			
Any holes or tears present in used sock?		Describe damage		
Ined Sock Demand?		Poole Lobel	< +1 1 1 2 H -2	
		A Sock Laber.	CONTROL COLLES	
Used Sock Supping Prep	Used	1 Sock Sealed?	Used Sock Placed in Plastic Bag?	
Used Sock Plastic Bag Labeled?		Bag Label:	Control CI3 # 3	1
New Sock Weighed Pre-Install?		Weight:	pointides GF	
New Sock Installed and Labeled?		Sock Label:	Cantral CRS # 3	
Comments:			•	
Catch Basin #-	2			
Any holes or tears present in used sock?		Describe damage:	-	
Used Sock Removed?	۵	Sock Label;	Control CB #2	a.
Used Sock Shipping Prep	Used	1 Sock Sealed?	□ Used Sock Placed in Plastic Bag? □	
Used Sock Plastic Bag Labeled?		Bag Label:	Cantral CB #2	
New Sock Weighed Pre-Install?		Weight:	178 poinds 91	
New Sock Installed and Labeled?		Sock Label:	Control CB #2	
Comments:			C. G.D.S. C.C. S. Name (1995) 1. Dennyth	
Catch Basin #.	1			
Any holes or tears present in used sock?	ū	Describe damage:	: *	
Used Sock Removed?	D .	Sock Label:	Control CB #1	
Used Sock Shipping Prep	Used	I Sock Sealed?	Used Sock Placed in Plastic Bag?	
Used Sock Plastic Bag Labeled?	0	Bag Label:	Cartral (R#1	
New Sock Weighed Pre-Install?	. D	Weight:	178 notifies all	
New Sock Installed and Labeled?		Sock Label	Cartral CTE H 1	
Comments:			Souther Coto and	
				1997 1997

Sump Sock Sediment Collection	on and	Dry Weight A	nalysis	Field Data Coll	ection For	rm			
CB Cleaning Month:	11		-	Data Collector Name:	Gardon	Crane	1441-1		
Location (Circle One):	<u> </u>	(Test-Site)	L	Cont	rol-Site		\cap	١	
Comments:	la norma la sua							1	Ч.,
(1)							10	Je	L
Catch Basin #.									
Any holes or tears present in used sock?		Describe damage:							
Used Sock Removed?		Sock Label:	Te	ST CB #	C'mo-				
Used Sock Shipping Prep	Used	1 Sock Sealed?	D	Used Sock Placed in	Plastic Bag?	ū			
Used Sock Plastic Bag Labeled?		Bag Label:	1	est CB #	-6.				
New Sock Weighed Pre-Install?		Weight:	1	34	pour	ias Gv	1		
New Sock Installed and Labeled?		Sock Label:	per la construcción de la constr	lect CB a	#5				
Comments:					• * * * *				
Catch Basin #.	送 法的	A 2	能認識				153		
Any holes or tears present in used sock?	۵	Describe damage:	•	1	70			×.	
Used Sock Removed?	Ģ	Sock Label:	70	est CB.	#6				
Used Sock Shipping Prep	Used	1 Sock Sealed?	D.	Used Sock Placed in	Plastic Bag?	Ģ.			
Used Sock Plastic Bag Labeled?	Ľ	Bag Label:	70	est CB #	L (
New Sock Weighed Pre-Install?		Weight:		180	pour	ids Gr			
New Sock Installed and Labeled?		Sock Label:	- Paras	Test CB :	任6				
Comments:									
Catch Basin #.		7 .2006.6							
Any holes or tears present in used sock?		Describe damage:							
Used Sock Removed?		Sock Label:	70	est CB #	7			25	
Used Sock Shipping Prep	Used	I Sock Sealed?		Used Sock Placed in	Plastic Bag?				
Used Sock Plastic Bag Labeled?		Bag Label:		est CE #	+7				
New Sock Weighed Pre-Install?		Weight:		174	pqu	ndsGr			
New Sock Installed and Labeled?		Sock Label:	Te	est CE	件7				
Comments:				-14					
		No Soch	e H	his CB					
Catch Basin #.	8						·		
Any holes or tears present in used sock?	500 ·	Describe damage:	:		Non-service and a second section of the second s			•	
Used Sock Removed?	. 🗆	Sock Label:		ANIMO STRATE AND				-	
Used Sock Shipping Prep	Used	Sock Sealed?		Used Sock Placed in	Plastic Bag?				
Used Sock Plastic Bag Labeled?	٥	Bag Label:	<u> </u>			·			
New Sock Weighed Pre-Install?	. 🗆	Weight:		and the second second	boh	hąs	120		
New Sock Installed and Labeled?		Sock Label:	3				8	· ·	
Comments:			:	······································		;	5. 13	a	
50 C		 S) 	×	. i				X	

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October 2019 Data Collection Event

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	Dr.	+ 2019 I	Data Collector Name:	Georgian (Fame
Date:	10	1-30-19	Data Collection Time:	- Composed and
Location (Circle One):	· · ·	Test-Sife	Contr	ol-Site)
Comments:				6
Catch Basin #.	4			
Any holes or tears present in used sock?		Describe damage:		
Used Sock Removed?		Sock Label:	Control CB	#4
Used Sock Shipping Prep	Used	d Sock Sealed?	Used Sock Placed in I	Plastic Bag? 🛛
Used Sock Plastic Bag Labeled?		Bag Label:	Control CB	the of
New Sock Weighed Pre-Install?		Weight:	182	pounds GM
New Sock Installed and Labeled?		Sock Label:	Control CB	#4
Comments:			vanakuman amatsi albu uu su neu susan asuma	
Catch Basin #:	1.5			
Any holes or tears present in used sock?		Describe damage:		
Used Sock Removed?		Sock Label:	Control CB:	#3
Used Sock Shipping Prep	Used	1 Sock Sealed?	Used Sock Placed in I	Plastic Bag?
Used Sock Plastic Bag Labeled?		Bag Label:	Control CB	, # 3
New Sock Weighed Pre-Install?		Weight:	178	poinds GV
New Sock Installed and Labeled?		Sock Label:	Control CB	#30
John Guta				
Catch Basin #:	52	ners and a constant General Constant		
Catch Basin #.	2 -	Describe damage:		
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed?	 	Describe damage: Sock Label:	Control CB	#2
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep	□ □ Used	Describe damage: Sock Label: Sock Sealed?	Control CB	- :# 2 Plastic Bag? □
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?	Used	Desoribe damage: Sock Label: Sock Sealed? Bag Label:	Control CB Used Sock Placed in I	- #2 Plastic Bag? □ #2
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install?	Used	Describe damage: Sock Label: Sock Sealed? Bag Label: Weight:	Control CB Used Sock Placed in I Control CB (78)	- #2 Plastic Bag?
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled?	Used	Desoribe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label:	Control CB Used Sock Placed in I Control CB (78 Control CB	- #2 Plastic Bag? □ #2 pointds_g? #2
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments:		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label:	Control CB Used Sock Placed in 1 Control CB (78 Control CB	- #2 Plastic Bag? □ #2 pointes g (#2
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments:		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label:	Control CB Used Sock Placed in 1 Control CB (78 (ontrol CB	- #2 Plastic Bag? □ #2 pointids g f #2
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock?		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Describe damage:	Control CB Used Sock Placed in I Control CB (78 Control CB	- HZ Plastic Bag? HZ pointds g(HZ
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed?		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Describe damage: Sock Label:	Control CB Used Sock Placed in I Control CB (78) Control CB	- #2 Plastic Bag? □ #2 pointds g? #2
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Describe damage: Sock Label:	Control CB Used Sock Placed in I Control CB (78 Control CB Control CB Used Sock Placed in I	- H ≥ Plastic Bag? □ H ≥ poinds g (H 2 H 2 H 2 H 2 H 2 H 2 H 2 H 2 H 2 H 2
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled?		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Sock Label: Sock Label: Sock Label: Sock Sealed? Bag Label:	Control CB Used Sock Placed in I Control CB (78) (ontrol CB Control CB Used Sock Placed in I Control CB	$\frac{4}{4} \geq \frac{2}{2}$ Plastic Bag? $\frac{4}{2} \geq \frac{2}{4} \geq \frac{2}{2}$ $\frac{4}{4} \geq \frac{2}{2}$ $\frac{4}{4} \geq \frac{2}{2}$ Plastic Bag? $\frac{4}{2} \leq \frac{2}{2}$
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install?		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Sock Label: Sock Label: Sock Sealed? Bag Label: Weight:	Control CB Used Sock Placed in I Control CB (78 Control CB Control CB Used Sock Placed in I Control CB Used Sock Placed in I Control CB (72	Plastic Bag? □ H 2 Pounds 9 (H 2 Founds 9 (H 2 Plastic Bag? □ H (Plastic Bag? □ Founds 9 (Plastic Gag? □
Catch Basin #- Any holes or tears present in used sock? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Installed and Labeled? Comments: Catch Basin #: Any holes or tears present in used sock? Used Sock Removed? Used Sock Removed? Used Sock Removed? Used Sock Shipping Prep Used Sock Plastic Bag Labeled? New Sock Weighed Pre-Install? New Sock Weighed Pre-Install?		Describe damage: Sock Label: Sock Sealed? Bag Label: Weight: Sock Label: Sock Label: Sock Label: Sock Sealed? Bag Label: Weight:	Control CB Used Sock Placed in I Control CB (78) Control CB Used Sock Placed in I Control CB Used Sock Placed in I Control CB (72) Control CB (72) Control CB	$\begin{array}{c} + & 2 \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$

Sump Sock Sediment Collection	on and	Dry Weight A	nalysis Field Data Collection Form
CB Cleaning Month:	00	F. 20191 .	Data Collector Name: Grosdan Crane
Location (Circle One):	1.0.	(Test-Site)	Data Collection Time:
Comments:			Control-Site
5			tage
Catch Basin #:	Ę	37.000	
Any holes or tears present in used sock?		Describe damage:	
Used Sock Removed?		Sock Label:	Test CB # 5
Used Sock Shipping Prep	Used	1 Sock Sealed?	□ Used Sock Placed in Plastic Bag? □
Used Sock Plastic Bag Labeled?		Bag Label:	Test CB # 6.
New Sock Weighed Pre-Install?		Weight:	180 pounds GV
New Sock Installed and Labeled?		Sock Label:	Test CB # 5
Comments:		83 	
			6
Catch Basin # .		E and	
Any holes or tears present in used sock?		Describe damage:	
Used Sock Removed?		Sock Label:	Test CB 46
Used Sock Shipping Prep	Used	I Sock Sealed?	□ Used Sock Placed in Plastic Bag? □
Used Sock Plastic Bag Labeled?	Ľ	Bag Label:	Test CB # 6
New Sock Weighed Pre-Install?		Weight:	180 pounds Gr
New Sock Installed and Labeled?		Sock Label:	Teet CB #6
Comments:			
Catch Basin #:		V ere in	
Any holes or tears present in used sock?		Describe damage:	-
Used Sock Removed?		Sock Label:	Test CB #7
Used Sock Shipping Prep	Used	Sock Sealed?	□ Used Sock Placed in Plastic Bag? □
Used Sock Plastic Bag Labeled?		Bag Label:	Test CE # 7
New Sock Weighed Pre-Install?		Weight:	180 politide r
New Sock Installed and Labeled?		Sock Label:	Test CZ #7
Comments:			
e	•	No Soch	this CB
Catch Basin #:	B		
Any holes or tears present in used sock?	****	Describe damage:	
Used Sock Removed?	. 🗆	Sock Label:	
Used Sock Shipping Prep	Used	Sock Sealed?	Used Sock Placed in Plastic Bag?
Used Sock Plastic Bag Labeled?	٥	Bag Label:	
New Sock Weighed Pre-Install?	· 🗆	Weight:	pojhds
New Sock Installed and Labeled?		Sock Label:	
Comments:	• •		
*		e	9 45 A

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Appendix F Sieve Analysis Summary Data

Catch Basin Sieve Results

		North	South	North	South	North	South	South	North	South	North	South	North	South	North		Average	
Sieve Size	Particle Size (mm)	042018CBTS	042018CBCS	082318CBTS	082318CBCS	103118CBTS	103118CBCS	042519CBTS	042519CBCS	062419CBTS	062419CBCS	082819CBTS	082819CBCS	102919CBTS	102919CBCS	CB - Overall Average	CB - North	CB - South
1"	25.400																	1
3/4"	19.000			100		100		100	100		100					100.0	100.0	100.0
1/2"	12.700			98	100	98	100	95	98	100	98					98.4	98.0	99.0
3/8"	9.510			95	99	96	98	92	96	97	96	100	100	100	100	97.4	97.2	98.2
1/4"	6.350			89	93	91	92	-	-			91	95	88	85	90.5	90.0	91.3
#10	2.000	80	89	65	67	73	70	67	78	82	88	75	72	67	65	74.1	74.5	75.5
#16	1.190			56	58	59	51	54	65	74	60	65	53	59	56	59.2	58.2	57.2
#30	0.595			41	46	45	35	36	44	68	50	53	35	45	46	45.3	43.5	42.7
#40	0.420	44	71	35	39	39	29	28	35	63	47	44	27	22	42	40.4	38.4	41.4
#100	0.149			17	22	24	20	11	11	46	36	25	14	12	27	22.1	21.5	21.7
#200	0.074	21.2	43.7	9.8	15	20	17	5.4	4.9	30	27	19	10	8.2	16	17.7	15.6	19.1
0.005mm	0.005	5.4	36.9	1.3	3.5	10	7.8					7.9	5.8	6.6	5.1	9.0	5.5	11.8
0.001mm	0.001			1.3	1.7	4.0	3.0					4.5	2.9	3.3	2.4	2.9	2.7	2.5

Street Sweep Sieve Results

Sieve Size	Particle Size	North	South	South	North		Average	
Sieve Size	(mm)	061818SSTS	6242019SSTS	101919SSTS	101919SSCS	SS - Overall Average	SS - North	SS - South
1"	25.400	,						
3/4"	19.000	100	100			100.0	100	100.0
1/2"	12.700	99	97			98.0	99	97.0
3/8"	9.510	95	86	100	100	93.7	97.5	93.0
1/4"	6.350	88		77	78	82.5	83	77.0
#10	2.000	56	43	53	46	50.7	51	48.0
#16	1.190	40	30	44	29	38.0	34.5	37.0
#30	0.595	22	19	32	14	24.3	18	25.5
#40	0.420	16	15	27	9	19.3	12.5	21.0
#100	0.149	8	8	12	3	9.3	5.5	10.0
#200	0.074	5.3	4.5	8.6	1.9	6.1	3.6	6.6
0.005mm	0.005	2.3		3	0	2.7	1.15	3.0
0.001mm	0.001	1		0	0	0.5	0.5	

Sump Sock Sieve Results

		North	South	South	North	South	North	North	South		Average	
Sieve Size	Particle Size									CBS - Overall	CDC North	CDC South
	(mm)	061918(CBS)TS	061918(CBS)CS	062419(CBS)TS	062419(CBS)CS	102919(CBS)TS	102919(CBS)CS	4/23/2020	4/23/2020	Average	CBS - North	CBS - South
1"	25.400											
3/4"	19.000			100						100.0		100.0
1/2"	12.700		100	98	100					99.3	100.0	99.0
3/8"	9.510	100	99	96	97	100				98.4	98.5	98.3
1/4"	6.350	95	97			86	100			94.5	97.5	91.5
#10	2.000	86	78	88	82	73	73	89	96	83.1	82.5	83.8
#16	1.190	83	73	60	74	71	71	89	95	77.0	79.3	74.8
#30	0.595	81	69	50	68	67	69	85	92	72.6	75.8	69.5
#40	0.420	80	68	47	63	66	68	83	91	70.8	73.5	68.0
#100	0.149	76	61	36	46	61	66	74	85	63.1	65.5	60.8
#200	0.074	73	55	27	30	57	65	69	80	57.0	59.3	54.8
0.005mm	0.005	22	15			18	31	31	36	25.5	28.0	23.0
0.001mm	0.001	5	2.4			8.1	8.5	18	19	10.2	10.5	9.8

Appendix G Organic Content & Moisture Content Summary

							Organio	Content						
		CB Test (N)			CB Control (S	3		Swoon Tost (N)			Sween Test (S)			CB Socks
		CD Test (N)			CD CONTION (S	<i>,</i> ,	Sweep lest (N)			Sweep Test (5)			Control	Test
Sample Date	Sample #1	Sample #2	Sample #3	Sample #1	mple #1 Sample #2 Sample #3 S			Sample #2	Sample #3	Sample #1	Sample #2	Sample #3	Sample 1	Sample 1
4/20/2018		15.3			43.8									
8/22/2018	30.7	17.4	39.7	19.6	16.9	37.7	5.8	6.2	5.6					
4/25/2019)	13.5			10.3									
8/28/2019	5.8	9.7	4.6	13.4	10.8	11.9								
10/29/2019	15.2	25.7	20.2	22.9	33.7	20.6	5.7	8.2	5	3.1	2.9	4.3		
4/24/2020													25	26.9

	Moisture Content												
		CB Test (N)			CB Control (S)		Sweep Test (N	1)	Sweep Control (N)			
Sample Date	Sample #1 Sample #2 S		Sample #3	Sample #1	Sample #2	Sample #3	Sample #1	Sample #2	Sample #3	Sample #1	Sample #2	Sample #3	
4/20/2018		27.8											
8/23/2018	3 56.8 45.4		61	42.6	41.7	62.4	16.2	15.3	15.8				
4/25/2019		40		34.2									
8/28/2019	43.5	32.6	36.1	7.9	17.3	6							
10/30/2019	54.1	63.6	50.2	42.5	56.7	47.5	4.1	4	4.2	17.6	23.4	17.4	

Appendix H Street Sweeper Sediment Data Summary

Street Sediment Accumulation

Data C	ollection Da	ate															
Day	Month	Year	Data Collection Date	Basin #	Tub Contents	Tare Date	Tare Wt of Basin, Pallet (lb)	Dewater Date	Time to dewater (hours)	Dewatered Wt+basin,pallet (lb)	Sediment Wet Weight (lb)	Sediment Moisture Content (%) #1	Sediment Moisture Content (%) #2	Sediment Moisture Content (%) #3	Standard Deviation	Sediment Moisture Content (%)	Sediment Dry Weight (Ibs)
6	10	2017	Oct-17								0						
6	10	2017	Oct-17								0						
20	4	2018	Apr-18	2	Sweeper-Test Side	4/18/2018	111.3	4/27/2018 10:05	168.5	1872.7	1761.4					21.5	1,450
20	4	2018	Apr-18	4	Sweeper-Control Side	4/18/2018	115.2	4/27/2018 10:20	168	2932.9	2817.7					19.5	2,358
19	6	2018	Jun-18	3	Sweeper-Test Side	6/19/2018	110.3	7/3/2018 15:00	341	274.4	164.1	6.3	5.2	6	0.6	5.8	155
22	8	2018	Aug-18	3	Sweeper-Test Side	8/23/2018	114.5	8/30/2018 9:00	168	270.1	155.6	16.2	15.3	15.8	0.5	15.8	134
24	10	2018	Oct-18	4	Sweeper - Test Side	10/24/2018	109.5	10/31/2018 10:00	169	241.6	132.1	15.8	25.6	16.1	5.6	19.2	111
24	10	2018	Oct-18	3	Sweeper - Control Side	10/29/2018	104.3	10/31/2018 11:00	26.5	756.6	652.3	7.7	15.5	8.5	4.3	10.6	590
25	4	2019	Apr-19	3	Sweeper-Test Side	4/25/2019	111	5/2/2019 9:15	144.25	1528	1417	13.8	15.7	17.1	1.7	15.5	1,226
24	6	2019	Jun-19	4	Sweeper-Test Side	6/24/2019	100	6/25/2019 11:30	167	292	192	5.9	24.6	7.4	10.4	12.6	170
28	8	2019	Aug-19	4	Sweeper-Test Side	8/28/2019	101	9/10/2019 14:00	315.5	261	160	10	12.4	7.2	2.6	9.9	146
29	10	2019	Oct-19	4	Sweeper-Test Side	10/29/2019	102	11/7/2019 13:30	195	398	296	4.1	4	4.2	0.1	4.1	284
29	10	2019	Oct-19	1	Sweeper - Control Side	10/29/2019	108	11/7/2019 13:30	195	2139	2031	17.6	23.4	17.4	3.4	19.5	1,700

Data Collection Date]				Since las	st sweep	Since last CB clean		
Day	Month	Year	Data Collection Date	Basin #	Tub Contents	Days since last sweep	Days since last CB clean	Rate of Accumulation (g/d)	Normalized Accumulation (g/lineal mi/d)	Rate of Accumulation (g/d)	Normalized Accumulation (g/lineal mi/d)
6	10	2017	Oct-17								
6	10	2017	Oct-17								
20	4	2018	Apr-18	2	Sweeper-Test Side	196	196	3,355	4,389	3,355	4,389
20	4	2018	Apr-18	4	Sweeper-Control Side	196	196	5,457	7,460	5,457	7,460
19	6	2018	Jun-18	3	Sweeper-Test Side	60	60	1,172	1,534	1,172	1,534
22	8	2018	Aug-18	3	Sweeper-Test Side	65	65	938	1,227	938	1,227
24	10	2018	Oct-18	4	Sweeper - Test Side	62	65	811	1,061	774	1,012
24	10	2018	Oct-18	3	Sweeper - Control Side	187	62	1,431	1,956	4,316	5,900
25	4	2019	Apr-19	3	Sweeper-Test Side	183	183	3,040	4,156	3,040	4,156
24	6	2019	Jun-19	4	Sweeper-Test Side	60	60	1,289	1,762	1,289	1,762
28	8	2019	Aug-19	4	Sweeper-Test Side	65	65	1,016	1,389	1,016	1,389
29	10	2019	Oct-19	4	Sweeper-Test Side	63	63	2,047	2,799	2,047	2,799
29	10	2019	Oct-19	1	Sweeper - Control Side	371	63	2,079	2,719	12,240	16,013
Appendix I Catch Basin Sediment Weight Summary

Catch Basin Sediment Accumulation

Da	ta Collection	Date															
Day	Month	Year	Data Collection Date	Basin #	Tub Contents	Tare Date	Tare Wt of Basin, Pallet (lbs)	Dewater Date	Time to dewater (hours)	Dewatered Wt+basin,pallet (lbs)	Sediment Wet Weight (lbs)	Sediment Moisture Content (%) #1	Sediment Moisture Content (%) #2	Sediment Moisture Content (%) #3	Standard Deviation	Sediment Moisture Content (%)	Sediment Dry Weight (Ibs)
6	10	2017	Oct-17	1							0						
6	10	2017	Oct-17	3							0						
20	4	2018	Apr-18	1	CB Clean-Test Side	4/20/2018	110.4	4/27/2018 10:00	168.5	303.40	193.00					27.80	151.02
20	4	2018	Apr-18	3	CB Clean-Control Side	4/20/2018	102.9	4/27/2018 10:10	168	262.3	159.4					22.15	130.50
19	6	2018	Jun-18	1	CB Clean-Test Side	6/19/2018	107.8	7/3/2018 15:00	341	141.8	34	27.8	29.5	20.5	4.8	25.9	27.00
19	6	2018	Jun-18	4	CB Clean-Control Side	6/19/2018	100.8	7/3/2018 15:00	341	151.2	50.4	23.1	40.9	45	11.6	36.3	36.97
22	8	2018	Aug-18	1	CB Clean-Test Side	8/23/2018	109.1	8/29/2018 16:00	151	137.4	28.3	56.8	45.4	61	8.1	54.4	18.33
22	8	2018	Aug-18	2	CB Clean-Control Side	8/23/2018	108.3	8/29/2018 16:00	151	149.6	41.3	42.6	41.7	62.4	11.7	48.9	27.74
24	10	2018	Oct-18	2	CB Clean-Test Side	10/24/2018	101.9	10/31/2018 11:00	169	174.7	72.8	43.3	37.9	46.9	4.5	42.7	51.02
24	10	2018	Oct-18	1	CB Clean-Control Side	10/24/2018	108.1	10/31/2018 11:00	169	168.1	60	64.4	58.5	48.1	8.3	57.0	38.22
25	4	2019	Apr-19	2	CB Clean-Test Side	4/25/2019	105	5/2/2019 0:00	144.25	230	125	45.6	43.7	36.2	5.0	41.8	88.13
25	4	2019	Apr-19	4	CB Clean-Control Side	4/25/2019	114	5/2/2019 0:00	144.25	183	69	42.5	29.3	40.8	7.2	37.5	50.17
24	6	2019	Jun-19	3	CB Clean-Test Side	6/24/2019	106	6/25/2019 11:30	167	183	77	35	39.5	38.9	2.4	37.8	55.88
24	6	2019	Jun-19	2	CB Clean-Control Side	6/24/2019	109	6/25/2019 11:30	167	131	22	1.9	2.5	3.3	0.7	2.6	21.45
27	8	2019	Aug-19	3	CB Clean-Test Side	8/28/2019	108	9/10/2019 11:45	313.25	167	59	43.5	32.6	36.1	5.6	37.4	42.94
28	8	2019	Aug-19	2	CB Clean-Control Side	8/28/2019	103	9/10/2019 11:45	313.25	156	53	7.9	17.3	6	6.1	10.4	48.01
29	10	2019	Oct-19	3	CB Clean-Test Side	10/30/2019	109	11/5/2019 15:30	149	159	50	54.1	63.6	50.2	6.9	56.0	32.06
29	10	2019	Oct-19	2	CB Clean-Control Side	10/30/2019	104	11/5/2019 15:30	149	128	24	42.5	56.7	47.5	7.2	48.9	16.12

Da	ta Collection	Date]					Since last stre	et sweep	Since last	CB cleaning
Day	Month	Year	Data Collection Date	Basin #	Tub Contents	Days since last sweep	Days since last CB clean	Rate of Accumulation (g/d)	Normalized Accumulation (g/CB/d)	Rate of Accumulation (g/d)	Normalized Accumulation (g/CB/d)
6	10	2017	Oct-17	1							
6	10	2017	Oct-17	3							
20	4	2018	Apr-18	1	CB Clean-Test Side	196	196	349	22.1	349	22.1
20	4	2018	Apr-18	3	CB Clean-Control Side	196	196	302	15.8	302	15.8
19	6	2018	Jun-18	1	CB Clean-Test Side	60	60	204	12.9	204	12.9
19	6	2018	Jun-18	4	CB Clean-Control Side	60	60	279	14.6	279	14.6
22	8	2018	Aug-18	1	CB Clean-Test Side	65	65	128	8.1	128	8.1
22	8	2018	Aug-18	2	CB Clean-Control Side	125	65	235	12.2	194	10.1
24	10	2018	Oct-18	2	CB Clean-Test Side	62	62	373	23.6	373	23.6
24	10	2018	Oct-18	1	CB Clean-Control Side	187	62	250	13.0	280	14.6
25	4	2019	Apr-19	2	CB Clean-Test Side	183	183	218	11.4	218	13.8
25	4	2019	Apr-19	4	CB Clean-Control Side	183	183	124	7.9	124	6.5
24	6	2019	Jun-19	3	CB Clean-Test Side	60	60	422	22.0	422	26.7
24	6	2019	Jun-19	2	CB Clean-Control Side	243	60	134	8.5	162	8.5
28	8	2019	Aug-19	3	CB Clean-Test Side	65	65	300	15.6	300	19.0
28	8	2019	Aug-19	2	CB Clean-Control Side	308	65	176	11.1	335	17.5
29	10	2019	Oct-19	3	CB Clean-Test Side	63	63	231	12.0	231	14.6
29	10	2019	Oct-19	2	CB Clean-Control Side	371	63	166	10.5	116	6.1

Appendix J Catch Basin Depth Summary

									Since last sweep	since last CB cleaning	since last data	collection event
						Average Depth of	Average Depth of	Average Weight of	Average Normalized	Average Normalized	Normalized Accumulation	Normalized Ac
Day	Month	Year	Date	CB #	Side	Sediment (in)	Sediment (ft) - δR	Sediment (lb)	Accumulation Rate (in/CB/d)	Accumulation Rate (in./d)	Rate (in/CB/day)	Rate (in/CB/
6	10	2018	Oct-17									
				1	Test							
				2	Test	3 20	0.002	151 017	0.0004	0.00036	4 305-03	5 30F
				3	Test	5.20	0.002	151.017	0.0004	0.00030	4.302-03	5.50
20	Δ	2018	Δpr-18	4	Test							
20	-	2018	Api-10	5	Control							
				6	Control	3.18	0.002	130 495	0.0004	0.00037	4.46F-03	5.54F-
				7	Control			2001100				0.0.12
				8	Control							
				1	Test	_						
				2	Test	0.94	0.002	26.998	0.0004	0.00035	4.13E-03	1.73E-
				3	Test	-						
19	6	2018	Jun-18	4	Control							
				6	Control	-						
				7	Control	1.11	0.002	36.968	0.0004	0.00043	5.08E-03	1.81E-
				8	Control	-						
				1	Test							
				2	Test							
				3	Test	0.73	0.002	18.329	0.0003	0.00025	2.94E-03	1.60E-
22	0	2019	Aug 19	4	Test							
25	0	2010	Aug-10	5	Control							
				6	Control	0.38	0.002	27,737	0.0003	0.00013	1.60F-03	1.67F-
				7	Control							1.072
				8	Control							
				1	Test	-						
				2	Test	0.54	0.002	51.016	0.0002	0.00019	2.33E-03	1.70E-
				3	Test	-						
24	10	2018	Oct-18	4 5	Control							
				6	Control	-						
				7	Control	- 0.55	0.002	38.217	0.0003	0.00021	2.46E-03	1.78E-
				8	Control	1						
				1	Control							
				2	Control	1 /1	0.002	50 170	0.0003	0.00017	2 01E-03	5 655
				3	Control	1.41	0.002	50.170	0.0002	0.00017	2.011-05	5.05
25	4	2019	Apr-19	4	Control							
				5	Test	_						
				6	Test	3.30	0.002	88.132	0.0004	0.00041	4.93E-03	5.90E-
				/	Test	_						
				8	Test							
				2	Control	-						
				2	Control	0.12	0.002	21.449	0.0001	0.00004	5.26E-04	1.73E-
				4	Control	-						
24	6	2019	Jun-19	5	Test							
				6	Test	0.50	0.000	FF 070	0.0000	0.00000	2 6 4 5 4 2	
				7	Test	0.58	0.002	55.878	0.0002	0.00023	2.64E-03	1.81E-
				8	Test							
				1	Control							
				2	Control	0.88	0.002	48.007	0.0002	0.00030	3.57E-03	1.60F-
				3	Control	-	0.002		0.0002			1.001
28	8	2019	Aug-19	4	Control							
			0	5	Test	_						
				6	Test	0.64	0.002	42.940	0.0002	0.00023	2.71E-03	1.67E-
				· · · · · · · · · · · · · · · · · · ·	Test	-						
				0	Control							
				2	Control							
				3	Control	0.23	0.002	16.118	0.0002	0.00008	9.51E-04	1.65E-
		2012		4	Control							
30	10	2019	Oct-19	5	Test							
				6	Test	0.55	0.000	22.059	0.0000	0.00000	2 205 02	1 705
				7	Test	0.55	0.002	32.058	0.0002	0.00020	2.38E-U3	1.72E-
				8	Test							

Catch Basin Sediment Depth Summary



-06

Appendix K Catch Basin Sock Sediment Data Summary

Day	Month	Year	Collection Date	Comments	CB #	Side	Sock Installation Date	Days since last sweep	Days since last CB clean	Sock Tare Weight (g)	Dry Sock + Sediment Weight 1 (g)	Dry Sock + Sediment Weight 2 (g)	%RPD	Sediment Dry Weight (g)	Sediment Accumulation (g/sump sock/day)	Normalized Accumulation (g/sump sock/day)	Sediment Accumulation (g/sump sock/day)	Normalized Accumulation (g/sump sock/day)	Sum of Sediment Accumulated (g)	Average Sediment Dry Weight (g)	Standard Deviation	Average Accumulation (g/sump sock/ day)	Average Normalized Accumulation (g/sump sock/day)	Average Accumulation (g/sump sock/day)	Average Normalized Accumulation (g/sump sock/day)
			Jun-18	Socks placed after	1 2 3 4	Test Test Test Test	4/20/2018	60	60	276 278 282 280	350 450 600 450	350 450 400 450	0% 0% 40% 0%	74 172 218 170	1.233 2.867 3.633 2.833	0.283 0.869 0.943 0.751	1.233 2.867 3.633 2.833	0.28 0.87 0.94 0.75	634	158.5	0.296	2.64	0.71	2.64	0.71
19	6	2018	Jun-18	clean/sweep	5 6 7	Control Control Control	4/20/2018	60	60	280 282 280	600 400 500	600 400 500	0% 0% 0%	320 118 220	5.333 1.967 3.667	1.37 0.57 1.02	5.333 1.967 3.667	1.37 0.57 1.02	658.0	219.3	0.399	3.66	0.99	3.66	0.99
			Aug-18		8 1 2 3	Control Test Test	6/19/2018	64	64	NO SOCK 274 280 278	NA 291.76 296.86 294.34	NA 291.76 296.88 293.98	0% 0%	NA 17.76 16.87 16.16	NA 0.278 0.264 0.253	NA 0.06 0.08	NA 0.278 0.264 0.253	NA 0.06 0.08	63.985	NA 16.00	NA 0.010	0.25	NA 0.07	0.25	NA 0.07
22	8	2018	Aug-18	Socks placed after clean/sweep	4 5 6	Test Control Control	6/19/2018	124	64	282 270 270	295.35 287.88 286.22	295.04 287.85 286.19	0% 0% 0%	13.195 17.865 16.205	0.206 2.725 1.082	0.05 0.70 0.32	0.206 0.279 0.253	0.05 0.07 0.07	57.2	19.1	0.016	1.92	0.52	0.30	0.08
			-		7	Control Control				272 NO SOCK	295.27 NA	295 NA	0%	23.135 NA	1.961 NA	0.55 NA	0.361 NA	0.10 NA		NA	NA		NA		NA
24	10	2010	Oct-18	Socks placed after	1 2 3 4	Test Test Test Test	8/23/2018	63	62	280 284 280 282	320 310 410 410	310 410 360 360	3% -28% 13% 13%	35 76 105 103	0.556 1.206 1.667 1.635	0.13 0.37 0.43 0.43	0.565 1.226 1.694 1.661	0.13 0.37 0.44 0.44	319	79.75	0.147	1.27	0.34	1.29	0.35
24	10	2018	Oct-18	clean/sweep	5 6 7	Control Control Control	8/23/2018	187	62	280 282 280	280 310 320	310 310 360	-10% 0% -12%	15 28 60	1.887 0.867 1.621	0.48 0.25 0.45	0.242 0.452 0.968	0.06 0.13 0.27	103.0	34.3	0.106	1.46	0.40	0.55	0.15
			Apr-19		8 1 2 3	Control Control Control Control	10/24/2018	183	183	NO SOCK 296 284 278	NA	NA		NA	NA 0.000 0.000 0.000	NA -	NA 0.000 0.000 0.000	NA - - -	0	NA #DIV/0!	0.000	0.00	0.00	0.00	0.00
25	4	2019	Apr-19	All socks OK, plastic bag labeled	4 5 6 7	Control Test Test	10/24/2018	187	183	288 278 288 276					0.000 0.000 0.000	-	0.000 0.000 0.000 0.000		0.0	#DIV/0!	0.000	0.00	0.00	0.00	0.00
					8	Test	-			NO SOCK	NA	NA		NA	NA	NA	NA	NA		NA	NA		NA		NA
			Jun-19	Manufacturer switched to	1 2 3	Control Control Control	4/25/2019	243	60	272 270 268	301.8 500 381.9	301.8 500 381.9	0% 0% 0%	29.8 230 113.9	0.123 0.947 0.469	0.03 0.29 0.12	0.497 3.833 1.898	0.11 1.16 0.49	484.3	121.075	0.436	0.50	0.14	2.02	0.56
24	6	2019	Jun-19	lighter weight fabric (reflected in CBS #5 and #7	4 5 6 7	Test Test Test	4/25/2019	60	60	274 272 274 272	384.6 340.96 287 400	384.6 340.96 287 400	0% 0% 0%	68.96 13 128	0.455	0.12 0.29 0.06 0.60	1.843 1.149 0.217 2.133	0.49 0.29 0.06 0.60	210.0	70.0	0.267	1.17	0.32	1.17	0.32
					8	Test				NO SOCK	NA	NA	0%/	NA E24	NA 1.707	NA	NA	NA		NA	NA		NA		NA
			Aug-19	Manufacturer switched to	2 3 4	Control Control Control	6/24/2019	307	64	278 272 276	400 650 650	400 650 650	0% 0% 0%	122 378 374	0.397 1.231 1.218	0.12 0.32 0.32	1.906 5.906 5.844	0.58 1.53 1.55	1398	349.5	0.561	1.14	0.29	5.46	1.38
27	8	2019	Aug-19	(reflected in CBS #5 and #8	5 6 7	Test Test Test	6/24/2019	64	64	182 276 176	650 800 800	650 800 800	0% 0% 0%	468 524 624	7.313 8.188 9.750	1.88 2.39 2.72	7.313 8.188 9.750	1.88 2.39 2.72	1616.0	538.7	0.427	8.42	2.33	8.42	2.33
					8	Test Control				NO SOCK	NA 303	NA 303	0%	NA 125	NA 0.338	NA 0.08	NA 2.016	NA 0.46		NA	NA		NA		NA
20	10	2010	Oct-19	Manufacturer switched to	2 3 4	Control Control Control	8/28/2019	370	62	178 178 174	269 276 209	269 276 209	0% 0% 0%	91 98 35	0.246 0.265 0.095	0.07 0.07 0.03	1.468 1.581 0.565	0.45 0.41 0.15	349	87.25	0.147	0.24	0.06	1.41	0.37
29	10	2013	Oct-19	(reflected in CBS #5 and #9	5 6 7	Test Test Test	8/28/2019	63	62	184 180 174	379 357 322	379 357 322	0% 0% 0%	195 177 148	3.095 2.810 2.349	0.79 0.82 0.66	3.145 2.855 2.387	0.81 0.83 0.67	520.0	173.3	0.089	2.75	0.76	2.80	0.77
					8	Test				NO SOCK	NA 331.3	NA 331.3	0%	NA 159.3	NA 0.900	NA 0.21	NA 0.905	NA 0.21		NA	NA		NA		NA
			Apr-19	Taken in April 2020, used to replace sample lost in lab fire; Manufacturer	2 3 4	Control Control Control	10/30/2019	177	176	172 178 178 182	406.37 650 350.91	406.37 650 350.91	0% 0% 0%	228.37 472 168.91	1.290 2.667 0.954	0.39	1.298 2.682 0.960	0.21 0.39 0.70 0.25	1028.58	257.145	0.220	1.45	0.39	1.46	0.39
24	4	2020	Apr-20	switched to lighter weight fabric (reflected in CBS #5 and #9	5 6 7	Test Test Test	10/30/2019	177	176	180 180 182	419.15 372.73 376.96	419.15 372.73 376.96	0% 0% 0%	239.15 192.73 194.96	1.351 1.089 1.101	0.35 0.32 0.31	1.359 1.095 1.108	0.35 0.32 0.31	626.8	208.9	0.020	1.18	0.32	1.19	0.33
					8	Test				NO SOCK	NA	NA		NA	NA	NA	NA	NA		NA	NA		NA		NA

Appendix L Weather Data During Study

Weather History for Ellensburg, WA [KWAELLEN22]											
Date	Т	emperature (°)	W	/d Speed (mp	bh)	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum				
4/1/2018	49.5	39.5	29.5	26	9	33	0				
4/2/2018	47.2	36	24.9	25	9	36	0				
4/3/2018	51.1	39.3	27.5	16	4	19	0				
4/4/2018	49.7	41.9	34.1	14	3	17	0.02				
4/5/2018	49.2	44.2	39.1	4	1	7	0.1				
4/6/2018	52.4	48.6	44.8	13	4	18	0.01				
4/7/2018	56.3	49.6	42.9	18	7	23	0.31				
4/8/2018	51.4	43.2	35.1	21	8	26	0				
4/9/2018	60.5	49	37.5	15	5	19	0				
4/10/2018	56.9	47.7	38.4	22	5	28	0.04				
4/11/2018	52.5	43.2	33.9	16	4	22	0.12				
4/12/2018	51.9	44.8	37.7	22	13	32	0.02				
4/13/2018	53.7	43.2	32.8	15	4	17	0				
4/14/2018	57.6	48.7	39.8	10	4	15	0				
4/15/2018	54.8	47	39.2	9	2	18	0.15				
4/16/2018	49.7	45	40.3	17	5	23	0.01				
4/17/2018	48.9	42.7	36.4	26	10	29	0				
4/18/2018	55.5	44.3	33.2	14	3	18	0				
4/19/2018	64.7	46.9	29.1	16	5	22	0				
4/20/2018	65.8	51.4	37	15	5	23	0				
4/21/2018	53.4	47.1	40.8	26	13	31	0				
4/22/2018	59.1	45.4	31.7	14	4	16	0				
4/23/2018	64.9	46.6	28.3	19	4	31	0				
4/24/2018	69.5	50	30.5	18	5	25	0				
4/25/2018	77.7	55.8	35.2	11	3	15	0				
4/26/2018	77.9	55.8	33.6	12	3	18	0				
4/27/2018	81.4	58.8	36.2	35	8	42	0.08				
4/28/2018	56.5	51.2	46	24	14	32	0.04				
4/29/2018	59.6	51.6	43.6	26	13	32	0				
4/30/2018	60.7	52.2	43.6	20	11	27	0				
5/1/2018	64.5	55.8	47.1	26	11	29	0				
5/2/2018	75.5	58	40.5	21	7	28	0				
5/3/2018	79.2	62.6	46.1	15	4	20	0				
5/4/2018	74.2	64.1	53.9	20	10	27	0				
5/5/2018	71.4	61.6	51.7	14	5	21	0				
5/6/2018	74.9	62.3	49 7	13	3	16	0.3				
5/7/2018	77.6	67	56.4	16	5	19	0				
5/8/2018	78.1	63.2	48.3	23	5	30	0.08				
5/9/2018	64 3	57.5	50.6	25	11	30	0.02				
5/10/2018	60.2	53.8	47.3	23	12	34	0				

Weather History for Ellensburg, WA [KWAELLEN22]											
Date	Т	emperature ((°)	W	'd Speed (mp	bh)	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum				
5/11/2018	66.7	57.3	48	31	14	32	0.02				
5/12/2018	81.3	65.1	48.8	15	6	22	0				
5/13/2018	84.7	66.9	49.1	11	3	14	0				
5/14/2018	86.1	65.6	45	12	3	18	0				
5/15/2018	88.2	67.1	45.9	11	3	16	0				
5/16/2018	83.4	71.8	60.1	22	11	27	0				
5/17/2018	74.9	65	55.1	28	14	32	0				
5/18/2018	65.1	56	47	9	3	13	0				
5/19/2018	71.5	60.3	49.1	16	6	23	0				
5/20/2018	71.9	62.4	52.9	21	9	26	0.07				
5/21/2018	81.1	66.7	52.2	16	7	23	0				
5/22/2018	85.5	65.7	45.8	9	3	14	0				
5/23/2018	85.9	69.1	52.3	18	4	20	0				
5/24/2018	80.3	69.5	58.7	19	10	26	0				
5/25/2018	75.1	64.6	54	28	11	32	0				
5/26/2018	67	59.8	52.7	25	15	39	0				
5/27/2018	82.2	68.1	54.1	20	9	25	0				
5/28/2018	72.9	64.8	56.7	30	15	34	0				
5/29/2018	62.9	56.1	49.3	28	14	32	0				
5/30/2018	68.6	56.3	44.1	18	6	28	0				
5/31/2018	61.6	54.9	48.2	23	11	30	0				
6/1/2018	66.4	56.1	45.7	18	11	28	0				
6/2/2018	80.3	64.1	47.9	10	3	15	0				
6/3/2018	77.6	61.9	46.3	24	8	34	0				
6/4/2018	63.5	55.7	47.9	25	12	28	0				
6/5/2018	71.4	56.6	41.8	18	5	22	0				
6/6/2018	79.2	61.7	44.2	11	4	15	0				
6/7/2018	75.1	63.5	52	22	9	30	0				
6/8/2018	73.2	61.3	49.4	19	6	23	0.35				
6/9/2018	62.9	54.9	46.9	22	11	34	0.01				
6/10/2018	59.4	51.1	42.7	19	10	29	0.15				
6/11/2018	65.7	53.6	41.5	24	11	30	0				
6/12/2018	70.9	56.3	41.7	11	4	17	0				
6/13/2018	68	56.5	45	29	10	34	0				
6/14/2018	67.9	57.6	47.2	26	11	30	0				
6/15/2018	74.8	62.2	49.5	24	10	31	0				
6/16/2018	70.5	61.8	53.1	20	6	25	0.18				
6/17/2018	80.8	67.8	54.7	14	4	21	0				
6/18/2018	82.3	69	55.7	13	5	22	0				
6/19/2018	84.6	70.8	56.9	16	4	19	0				

Weather History for Ellensburg, WA [KWAELLEN22]											
Date	Т	emperature ((°)	W	/d Speed (mp	h)	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum				
6/20/2018	87.7	71.1	54.4	13	3	21	0				
6/21/2018	83.8	71.4	59	26	10	34	0				
6/22/2018	75.8	67.4	59.1	25	13	32	0				
6/23/2018	73.8	64.9	56.1	30	13	31	0				
6/24/2018	87.6	68.6	49.6	17	5	20	0				
6/25/2018	69.2	61.5	53.9	28	14	40	0.01				
6/26/2018	72.1	60	47.9	24	8	29	0				
6/27/2018	76.4	62.7	48.9	24	9	37	0				
6/28/2018	66.8	61.2	55.5	34	15	40	0				
6/29/2018	75.3	63.2	51	27	9	32	0				
6/30/2018	70.4	61.2	52	24	10	33	0				
7/1/2018	69.2	61.5	53.8	28	13	37	0				
7/2/2018	64.3	57.2	50	31	13	34	0				
7/3/2018	77.7	64.3	51	13	5	17	0				
7/4/2018	78.6	60.8	43.1	18	5	26	0				
7/5/2018	92.2	71.1	50.1	25	6	30	0				
7/6/2018	86.7	73.6	60.6	25	8	32	0				
7/7/2018	76.9	65.8	54.8	20	8	27	0				
7/8/2018	87.2	68.6	49.9	13	5	18	0				
7/9/2018	90.6	75.3	60.1	28	9	33	0				
7/10/2018	73.7	65.7	57.7	29	14	31	0				
7/11/2018	86.1	70.1	54	16	5	16	0				
7/12/2018	93.6	75.5	57.4	12	4	17	0				
7/13/2018	93.9	75.8	57.6	23	7	30	0				
7/14/2018	89.7	76.3	62.9	15	5	25	0				
7/15/2018	94 7	73.1	51.4	10	3	17	0				
7/16/2018	72	63.8	57.1	2	1	1 / Д	0				
7/17/2018	94.9	78 1	61.2	2	7	30	0				
7/18/2018	87 <i>4</i>	75.5	63.6	22	12	31	0				
7/10/2018	80.8	70.4	50.0	22	12	35	0				
7/20/2018	77.0	67.4	56.0	24	13	35	0				
7/21/2018	77.9	66	54.1	10	10	25 26	0				
7/22/2018	97.5	67.2	J4.1 47	19	2	16	0				
7/22/2018	07.5	71.9	4/ 50.7	10	5	10	0				
7/23/2018	92.8	/1.8	50.7	14	4	10	0				
7/24/2018	94	74.0	547	13	Э л	23	U A				
7/26/2018	93.Z	/4.9 77 5	54./	10	4	24	U A				
7/20/2018	95.5	11.5	59.5	13	4	20	U A				
7/22/2018	94.8	70.1	59.1	14	4	20	U				
7/28/2018	93.2	/9.1	65	11	4	1/	U				
7/29/2018	96.7	/6.4	56.2	13	3	16	U				

	Weather	History for	r Ellensbur	rg, WA [KV	VAELLEN	[22]	
Date	Т	'emperature ((°)	W	d Speed (mp	bh)	Precip. Daily (in)
	High	Avg	Low	High	Avg	Gust	Sum
7/30/2018	98.2	76.4	54.6	13	3	18	0
7/31/2018	99.7	81.6	63.6	20	6	29	0
8/1/2018	89.1	76.2	63.3	23	12	31	0
8/2/2018	74.7	67.8	61	29	12	42	0
8/3/2018	73.7	66.1	58.4	26	13	32	0
8/4/2018	84.5	69.9	55.3	13	5	18	0
8/5/2018	87.9	71.2	54.6	9	3	14	0
8/6/2018	93.8	73.4	52.9	10	3	19	0
8/7/2018	96.7	76.4	56.2	10	2	12	0
8/8/2018	99	77.4	55.9	12	3	17	0
8/9/2018	103	81.9	60.8	9	2	13	0
8/10/2018	94.2	78.6	63	27	8	30	0
8/11/2018	75.7	67.8	59.8	28	14	37	0
8/12/2018	79.7	66.7	53.7	12	4	20	0
8/13/2018	84.2	66	47.8	12	2	12	0
8/14/2018	87.3	68	48.7	5	2	10	0
8/15/2018	91.9	70.9	49.9	9	2	10	0
8/16/2018	92.4	76.1	59.8	17	5	25	0
8/17/2018	85.7	75.3	65	22	8	27	0
8/18/2018	88.4	74	59.6	15	4	20	0
8/19/2018	84.5	67.7	50.8	9	2	10	0
8/20/2018	85.7	70.4	55.2	11	3	20	0
8/21/2018	84 5	67.6	50.6	12	3	15	0
8/22/2018	90.6	67.2	43.8	16	4	23	0
8/23/2018	78.8	67.9	57.1	28	11	38	0
8/24/2018	70.7	62.8	54.9	23	12	34	Û
8/25/2018	68.5	59.2	49.8	23	8	30	Û
8/26/2018	67.3	58.6	49.0	21	8	28	0
8/27/2018	77.1	65 2	53.2	14	6	19	0
8/28/2018	80.6	62.7	44 8	13	3	16	0
8/29/2018	82.7	64.2	45.8	21	6	33	0
8/30/2018	74	67.2	40.4	21	11	31	0
8/31/2018	73 1	61.4	40 7	23	0	20	0
9/1/2010	73.1	64.5	72.1 55 7	24 21	2 10	27	0
0/2/2010	878	67	51.7	21	Q	32 27	0 N
9/2/2010	02.0 77 6	68 /	50.2	10	0 0	27 24	0
0/1/2010	701	60	12	17	2	∠ + 15	0 0
0/5/2010	/ 0.1 02 1	61.2	42 40.4	12	3 2	1 J 1 A	0 N
9/5/2010	02.1 87.8	64.0	40.4	0	2	14	0 N
0/7/2010	01.0	72 /	42 58 6	7 24	כ ד	10	U N
9///2018	00.Z	13.4	38.0	34	/	58	U

Weather History for Ellensburg, WA [KWAELLEN22]											
Date	Т	emperature	(°)	W	/d Speed (mp	h)	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum				
9/8/2018	70.4	63.2	56	23	11	29	0				
9/9/2018	78.2	64.8	51.3	18	5	23	0				
9/10/2018	67.8	61	54.2	21	10	27	0				
9/11/2018	68.4	59.2	50.1	19	8	26	0.04				
9/12/2018	67.7	54.4	41.1	12	4	17	0				
9/13/2018	66.7	53.6	40.5	17	5	21	0				
9/14/2018	69	52.3	35.6	15	4	19	0				
9/15/2018	65.7	54.1	42.5	11	4	18	0				
9/16/2018	62.2	52.2	42.2	16	5	27	0				
9/17/2018	66.9	53.1	39.2	11	3	15	0				
9/18/2018	72.7	54.5	36.4	7	2	12	0				
9/19/2018	72.8	56.8	40.7	18	5	23	0				
9/20/2018	67.9	59	50.1	19	10	25	0				
9/21/2018	74.4	58.8	43.1	11	2	14	0				
9/22/2018	69.2	59.2	49.3	20	6	30	0				
9/23/2018	62.8	55.8	48.8	24	12	39	0				
9/24/2018	71.5	57.3	43.1	11	4	16	0				
9/25/2018	73.9	54.1	34.2	14	2	14	0				
9/26/2018	79	57.1	35.2	7	2	10	0				
9/27/2018	79.3	59.7	40	14	3	17	0				
9/28/2018	73.3	57.7	42.1	14	4	18	0				
9/29/2018	69.7	53.9	38.2	18	6	23	0				
9/30/2018	62.3	50.6	38.9	12	5	18	0				
10/1/2018	66.5	56	45.5	6	2	13	0				
10/2/2018	64 6	53.8	42.9	26	9	44	0				
10/3/2018	53.7	42	30.4	13	4	17	0				
10/4/2018	62	48.5	35.1	13	3	20	0				
10/5/2018	51.1	42	33	6	2	8	0.12				
10/6/2018	63.1	+2 52 2	41.3	12	2	16	0.01				
10/7/2018	56.5	JZ.2 47.6	38.7	12 A	1	0	0				
10/8/2018	52	50.2	183	ч 0	2	11	0.08				
10/9/2018	59 7	52.8	45.9	8	2	13	0.00				
10/10/2018	50.3	/0.0	40.6	8	2	15	0				
10/11/2010	62.5	ד.ד 17 ק	32.8	о Л	∠ 1	1 <i>J</i> Q	0				
10/11/2010	68.0	τ/./ 51.5	32.0	+ 22	1	0 28	0 01				
10/12/2010	6/ 2	ло л	24.1	16	0 1	20 10	0.01				
10/13/2018	60.5	47.4	24.2	10	4	17	0				
10/14/2010	66.0	43.1	27.1	5	3 1	12	0				
10/15/2018	67.1	47.J 10	20.9 20.0	Л	1	/ 0	0				
10/10/2018	07.1	40	20.9	4 0	1	0	U A				
10/1//2018	0.10	47.9	2ð.2	ð	1	9	U				

	Weather	History for	r Ellensbur	g, WA [KV	VAELLEN	[22]	
Date	Т	`emperature ((°)	W	'd Speed (mp	h)	Precip. Daily (in)
	High	Avg	Low	High	Avg	Gust	Sum
10/18/2018	65.9	47.2	28.4	4	1	6	0
10/19/2018	68.3	49.1	29.9	4	1	7	0
10/20/2018	67.3	49.2	31	3	1	5	0
10/21/2018	67.5	48.5	29.6	4	1	7	0.01
10/22/2018	66.2	47.6	29.1	4	1	5	0
10/23/2018	58.7	44.3	29.9	15	2	23	0
10/24/2018	61.6	50.5	39.4	10	2	14	0
10/25/2018	48.4	43.8	39.3	4	1	8	0.1
10/26/2018	59.2	51.8	44.5	16	5	28	0.01
10/27/2018	57.9	44.8	31.7	11	3	19	0.27
10/28/2018	52.3	46.8	41.4	18	4	24	0.18
10/29/2018	53	43.2	33.3	15	5	23	0
10/30/2018	55	43.4	31.8	10	2	15	0.01
10/31/2018	58.3	50.5	42.8	8	2	12	0.06
11/1/2018	61.8	56.5	51.3	15	4	23	0.01
11/2/2018	59.7	53.2	46.7	28	9	35	0.02
11/3/2018	54.1	49.8	45.6	16	7	28	0
11/4/2018	53.6	47.9	42.2	33	12	41	0.01
11/5/2018	54.7	46.4	38.1	18	5	24	0
11/6/2018	53	43.8	34.7	18	6	25	0
11/7/2018	50.8	40.5	30.1	12	5	18	0
11/8/2018	46.9	34	21.1	3	1	7	0
11/9/2018	44.6	32.9	21.3	16	3	23	0.02
11/10/2018	52.2	39.2	26.1	9	2	10	0
11/11/2018	45.9	32.8	19.7	7	2	12	0
11/12/2018	40.4	30.4	20.3	3	1	6	0
11/13/2018	41.1	31.3	21.5	7	1	10	0.01
11/14/2018	38.2	32.2	26.2	6	2	8	0
11/15/2018	57.1	45.4	33.7	12	3	19	0
11/16/2018	52.8	44.5	36.2	14	5	19	0
11/17/2018	47	33.9	20.8	12	3	16	0
11/18/2018	45.7	31.9	18.1	4	1	7	0
11/19/2018	46.2	32.2	18.1	5	1	6	0
11/20/2018	43.8	30.5	17.1	6	1	7	0.01
11/21/2018	36.5	30.6	24.7	10	1	13	0
11/22/2018	41	35.5	30.1	8	2	14	0.11
11/23/2018	38.2	32.9	27.6	18	3	28	0.09
11/24/2018	48.8	40.1	31.4	12	4	18	0
11/25/2018	37	31.5	26	5	0	0	0
11/26/2018	34	30.5	27	3	0	0	0.04

Weather History for Ellensburg, WA [KWAELLEN22]											
Date	Т	emperature ((°)	W	/d Speed (mp	bh)	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum				
11/27/2018	48.8	40.7	32.5	7	1	0	0.04				
11/28/2018	37	34.7	32.3	4	0	0	0.13				
11/29/2018	43.3	40	36.8	7	0	0	0				
11/30/2018	47.5	40.7	33.8	6	1	0	0.12				
12/1/2018	37.4	35	32.6	4	0	0	0.12				
12/2/2018	41.1	35.8	30.6	6	0	0	0				
12/3/2018	38.2	34.1	30	7	1	0	0				
12/4/2018	33.1	28	22.9	4	1	0	0				
12/5/2018	36.5	28.5	20.6	8	3	0	0				
12/6/2018	32.1	26.5	20.9	8	2	0	0				
12/7/2018	28	24.6	21.3	7	1	0	0				
12/8/2018	31.4	28.1	24.8	6	1	0	0				
12/9/2018	33	30.1	27.3	4	0	0	0.01				
12/10/2018	29.7	26.9	24	2	0	0	0				
12/11/2018	34.5	29.7	24.9	25	0	0	0.01				
12/12/2018	43.1	37.4	31.8	17	3	0	0.09				
12/13/2018	47	38.8	30.6	5	0	0	0				
12/14/2018	36.2	32.7	29.2	13	2	0	0.01				
12/15/2018	39.6	35.4	31.3	8	2	0	0.01				
12/16/2018	35.6	34	32.5	4	0	0	0.23				
12/17/2018	40.4	36	31.6	6	1	0	0.02				
12/18/2018	50.7	42.4	34.1	10	2	0	0.29				
12/19/2018	43.7	37.8	31.8	8	2	0	0				
12/20/2018	45.5	39.8	34.2	28	4	0	0.01				
12/21/2018	40.3	33.6	26.9	21	6	0	0				
12/22/2018	33.7	28	20.9	8	1	0	0				
12/23/2018	37.9	33.7	29.4	6	0	0	0.06				
12/24/2018	34.6	32.6	30.6	0 7	1	0	0.04				
12/25/2018	31.0	30	28	7	2	0	0				
12/26/2018	32.6	30.6	28.6	, 4	0	0	0.04				
12/27/2018	38.7	30.9	23.1	4	1	0	0.02				
12/28/2018	29.1	25.2	21.3	2	0	0	0				
12/20/2018	18.9	38.8	21.5	2	3	0	0 04				
12/20/2018	42.3	37	31.7	21	8	0	0.09				
12/31/2018	40.8	31.0	23	29	2	0	0				
1/1/2010	27	20	25	7	∠ 1	0	0				
1/1/2019	2/0	27 28 2	21.1 21.6	і Л	1	0	0				
1/2/2019	206	20.2	21.0	+ 1	0	0	0				
1/3/2019	28.0 17	22 0	20.3 20.9	4	1	0	0				
1/4/2019	4/ 20 C	22.2	27.0	5	1	0	0				
1/3/2019	30.0	33.2	21.9	3	0	U	U				

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Т	'emperature ((°)	W	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum		
1/6/2019	40.8	34.6	28.4	5	1	0	0		
1/7/2019	42.1	35.1	28.1	9	2	0	0		
1/8/2019	32.2	29.5	26.7	6	1	0	0.02		
1/9/2019	36.2	32.6	29	5	1	0	0.11		
1/10/2019	34	32.5	31.1	4	1	0	0.01		
1/11/2019	36.1	32.2	28.4	4	1	0	0		
1/12/2019	35.9	31.7	27.5	5	1	0	0		
1/13/2019	33.9	30.5	27	5	1	0	0		
1/14/2019	28.1	27	26	8	2	0	0		
1/15/2019	28.7	27	25.2	7	1	0	0		
1/16/2019	34.3	29.2	24.2	4	0	0	0		
1/17/2019	36.3	33.5	30.8	4	0	0	0.35		
1/18/2019	36.4	33.2	30	6	1	0	0.32		
1/19/2019	35.2	32.1	29	4	1	0	0.15		
1/20/2019	36	32.2	28.3	3	0	0	0.04		
1/21/2019	43.2	32.4	21.6	18	3	0	0		
1/22/2019	37.3	33.1	28.9	4	0	0	0.01		
1/23/2019	50.1	39.9	29.7	22	4	0	0.1		
1/24/2019	47.2	36.3	25.5	7	1	0	0		
1/25/2019	50.8	39.2	27.7	7	1	0	0		
1/26/2019	47.5	37.3	27.2	5	0	0	0		
1/27/2019	60.4	43.9	27.4	10	2	0	0		
1/28/2019	44.5	34.6	24.7	10	1	0	0		
1/29/2019	42.9	31.6	20.3	7	1	0	0		
1/30/2019	30.4	25.8	21.1	6	1	0	0		
1/31/2019	30.8	29.5	28.2	5	1	0	0		
2/1/2019	33.4	30.9	28.3	5	1	0	0		
2/2/2019	44 4	36.1	27.8	4	1	0	0		
2/2/2019	39.8	32	24.3	11	3	0	0		
2/4/2019	31.9	27.5	21.5	12	2	0	0.02		
2/5/2019	23.7	18.7	13.6	8	2	0	0.01		
2/6/2019	25.7	14.1	2.8	5	0	0	0		
2/7/2019	23.4	11.6	0.4	<u>л</u>	1	0	0		
2/8/2019	24.3	17.5	10.8	т 7	1	0	0		
2/0/2019	27.J 25.7	20	10.0 1 <i>4 A</i>	/ &	2	0	0		
2/10/2019	25.1	10.2	17.4	10	2	0	0		
2/10/2019	∠J.U 10 1	17.2	12.0	12	2	0	0		
2/11/2019	10.1	14.Z	10.4	У Л	5	0	0.01		
2/12/2019	23.3 77 7	21 ۱۵ ۹	10./	4	0	0	0.01		
2/13/2019	21.1	19.8	11.8	С 7	0	0	0		
2/14/2019	30.2	24.2	18.2	/	0	0	U		

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Т	'emperature ((°)	W	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum		
2/15/2019	34.3	30	25.6	7	1	0	0.06		
2/16/2019	37.7	32.1	26.5	6	1	0	0.21		
2/17/2019	37	31.2	25.5	7	2	0	0.06		
2/18/2019	35.3	25.4	15.5	8	2	0	0.02		
2/19/2019	42.2	27.7	13.2	7	2	0	0		
2/20/2019	34.8	27.5	20.1	4	1	0	0		
2/21/2019	38	27.5	17.1	8	2	0	0		
2/22/2019	34.1	25.8	17.5	5	1	0	0		
2/23/2019	32.1	21.1	10.2	11	2	0	0		
2/24/2019	33.3	24.1	14.9	6	1	0	0.25		
2/25/2019	29.9	22.2	14.5	5	1	0	0.01		
2/26/2019	24.4	21.3	18.3	15	4	0	0		
2/27/2019	31.7	25.2	18.6	6	2	0	0		
2/28/2019	24.7	18	11.2	5	1	0	0.09		
3/1/2019	23	18.2	13.4	6	2	0	0.01		
3/2/2019	29.6	23.2	16.9	9	2	0	0.01		
3/3/2019	25.4	17.7	10	13	4	0	0		
3/4/2019	27	14.6	2.1	6	1	0	0		
3/5/2019	32.1	22.5	13	6	1	0	0		
3/6/2019	32	27.7	23.4	3	1	0	0.14		
3/7/2019	36.6	28.2	19.8	8	2	0	0.05		
3/8/2019	28.1	20.9	13.6	4	1	0	0.03		
3/9/2.019	32.4	20.2	8.1	5	1	0	0		
3/10/2019	31.2	19.6	7.9	6	1	0	0		
3/11/2019	33.1	19.5	6	5	1	0	0		
3/12/2019	42.7	33.5	24.2	22	5	0	0.01		
3/13/2019	46.9	39.5	32	11	4	0	0		
3/14/2019	42.6	32.7	22.8	5	0	0	0		
3/15/2019	47.5	38.2	22:0	8	1	0	0		
3/16/2019	48.1	37.2	25	4	1	0	0		
3/17/2019	57.5	42.9	28.3	6	1	0	0		
3/18/2019	59.6	42.7	25.8	0 7	1	0	0		
3/19/2019	60	43.5	25.0	9	2	0	0		
3/20/2019	64.5	46.5	28.5	9	1	0	0		
3/21/2019	67.8	50	32.1	8	2	0	0		
3/22/2019	64.4	52 /	10 A	0 1/	2	0	0		
3/22/2019	62.7	52. 4	40.4	17	5	0	0		
3/23/2019	102.7	JZ.1 15 5	+2.1 12.7	13	5	0	0.04		
3/24/2019	40.3	43.3 11	4∠./ 27	10	Л	0	0.04		
2/26/2010	55 57	44 16	וכ רכ	10	4	0	0.03		
5/20/2019	57	40	57	12	5	U	U		

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Т	Temperature (°)			Wd Speed (mph)				
	High	Avg	Low	High	Avg	Gust	Sum		
3/27/2019	55	42	28	9	2	0	0		
3/28/2019	57	47	39	14	3	0	0		
3/29/2019	56	46	38	9	2	0	0		
3/30/2019	61	46	29	12	3	0	0		
3/31/2019	64	47	31	9	2	0	0		
4/1/2019	63	49	36	14	4	0	0		
4/2/2019	63	52	38	12	4	0	0		
4/3/2019	59	51	43	21	7	0	0		
4/4/2019	59	51	42	14	5	0	0		
4/5/2019	57	49	39	16	6	0	0.09		
4/6/2019	55	43	33	10	4	0	0.05		
4/7/2019	57	47	38	23	8	1	0.3		
4/8/2019	51	46	42	9	3	0	0.1		
4/9/2019	54	48	40	34	13	0	0.02		
4/10/2019	52	46	40	25	13	0	0		
4/11/2019	52	46	39	10	4	0	0.07		
4/12/2019	58	49	40	21	7	0	0		
4/13/2019	50	46	40	18	8	0	0.02		
4/14/2019	48	41	34	16	7	0	0.02		
4/15/2019	53	44	31	14	4	0	0		
4/16/2019	59	47	36	21	6	0	0		
4/17/2019	61	52	46	23	11	3	0		
4/18/2019	69	57	47	10	4	1	0		
4/19/2019	62	56	51	22	8	0	0		
4/20/2019	64	55	48	18	10	1	0		
4/21/2019	68	54	41	20	10	1	0		
4/22/2019	71	53	41	20	7	0	Û		
4/23/2019	62	56	49	33	14	0	Û		
4/23/2019	68	55	44	23 24	11	2	0		
4/25/2019	66	50	29	9	3	0	0		
4/26/2019	64	55	46	24	12	0	Û		
4/27/2019	50	44	40	29	12	0	Û		
4/28/2019	57	47	34	15	6	0	Û		
4/20/2019	50	ч, 47	31	21	5	0	0		
A/20/2010	57	יד 10	31	12	5 Л	0	0 0		
5/1/2010	62	77 19	24 20	12	4 7	0	0 0		
5/1/2019	61	40 50	27 12	25 25	/ 12	0 2	0 N		
5/2/2019	01 47	50	43	20	10	ے 1	U A		
5/5/2019	0/	54 50	43 44	20	1U o	1	U A		
5/4/2019	13	39 (2	44 50	19	ð 7	0	U		
5/5/2019	75	63	52	1/	/	2	U		

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Temperature (°)			W	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum		
5/6/2019	78	63	45	15	5	0	0		
5/7/2019	78	66	50	17	6	1	0		
5/8/2019	77	64	50	10	4	0	0		
5/9/2019	76	67	51	20	6	1	0		
5/10/2019	82	61	39	12	3	0	0		
5/11/2019	85	63	41	13	3	0	0		
5/12/2019	77	65	55	21	10	1	0		
5/13/2019	75	64	53	22	9	1	0		
5/14/2019	60	56	49	17	6	0	0.1		
5/15/2019	63	53	40	18	4	0	0.09		
5/16/2019	62	56	51	9	2	0	0.27		
5/17/2019	59	54	48	32	16	4	0		
5/18/2019	67	55	40	16	6	0	0		
5/19/2019	70	60	53	20	5	0	0.11		
5/20/2019	63	55	49	17	5	0	0		
5/21/2019	67	57	48	15	6	1	0		
5/22/2019	69	59	52	17	5	1	0		
5/23/2019	79	63	47	17	4	0	0		
5/24/2019	64	58	51	24	12	1	0		
5/25/2019	59	54	49	17	7	1	0.01		
5/26/2019	65	55	48	11	4	0	0.22		
5/27/2019	78	65	55	19	6	0	0		
5/28/2019	83	68	59	11	6	1	0.07		
5/29/2019	81	67	56	21	8	1	0		
5/30/2019	85	69	57	12	4	1	0		
5/31/2019	86	71	54	13	4	0	0		
6/1/2019	86	71	56	16	7	0	0		
6/2/2019	86	71	56	20	8	1	0		
6/3/2019	72	63	56	28	16	4	0		
6/4/2019	75	64	53	25	10	3	0		
6/5/2019	72	60	52	20 22	6	0	0		
6/6/2019	60	53	45	22	12	2	0		
6/7/2019	60	50	38	22	11	0	0		
6/8/2019	67	56	46	22	11	0	0		
6/9/2019	76	60	40	10	3	0	ů 0		
6/10/2019	×0 81	66	47	26	7	0	Õ		
6/11/2019	85	71	т <i>і</i> 55	12	, Д	0	0 0		
6/12/2010	00	71	51	12	т Э	0	0		
6/13/2019	90 87	71 74	61	26	∠ 11	0	0 0		
6/14/2010	76	65	55	20	11	5	0		
0/14/2019	/0	05	55	20	14	5	U		

Weather History for Ellensburg, WA [KWAELLEN22]								
Date	ſ	ſemperature ((°)	W	Precip. Daily (in)			
	High	Avg	Low	High	Avg	Gust	Sum	
6/15/2019	85	69	56	19	10	1	0	
6/16/2019	78	66	61	26	11	3	0	
6/17/2019	85	72	62	30	15	5	0	
6/18/2019	75	67	60	35	16	5	0	
6/19/2019	64	58	50	34	15	2	0	
6/20/2019	64	55	48	38	16	3	0	
6/21/2019	72	61	52	28	16	4	0	
6/22/2019	76	64	52	31	13	0	0	
6/23/2019	70	61	55	27	14	4	0	
6/24/2019	73	60	4 9	30	12	0	0	
6/25/2019	78	62	46	21	7	0	0	
6/26/2019	76	60	47	26	6	0	0	
6/27/2019	67	56	46	20	5	0	0.01	
6/28/2019	72.4	59.1	45.1	20	4.6	0	0.35	
6/29/2019	81.5	64.3	46.6	11	3.9	0	0	
6/30/2019	82	67.8	52.4	16	3.6	0	0	
7/1/2019	86.4	69.4	53.8	18	4.3	0	0	
7/2/2019	70.7	63.8	57.6	33	16.4	4	0	
7/3/2019	81.8	65.7	55.7	29	12.3	0	0	
7/4/2019	82.1	68.2	58.2	30	14.4	3	0	
7/5/2019	84.6	68.4	53.2	29	8.4	0	0	
7/6/2019	73.6	65	59	38	16.8	6	0	
7/7/2019	74.5	64.4	55.9	28	12.4	3	0	
7/8/2019	83.8	67.5	56.8	22	7.8	0	0	
7/9/2019	81.1	66.5	51.6	14	3.3	0	0.01	
7/10/2019	81.2	69.6	61.6	24	5.8	0	0	
7/11/2019	80.7	68.8	60.4	30	10.6	0	0	
7/12/2019	80.3	69	57.9	20	8.2	0	0	
7/13/2019	81.3	70.4	63.6	30	14.1	2	0	
7/14/2019	82.2	70.1	57.1	27	11.7	3	0	
7/15/2019	77	66.9	60.8	22	9.1	2	0.01	
7/16/2019	79.1	67.7	57.3	17	6.4	0	0	
7/17/2019	76.6	66.6	61.1	29	10.9	0	0	
7/18/2019	68.9	62.1	55.8	39	16.3	0	0	
7/19/2019	76.6	62.4	50.5	26	10.9	1	0	
7/20/2019	80.9	65.1	46.2	12	4.2	0	0	
7/21/2019	86.7	69.5	49	13	2.9	0	0	
7/22/2019	94.4	74.4	56.2	25	5.6	0	0	
7/23/2019	91.1	72.3	61.9	31	13.2	4	0	
7/24/2019	77.5	65.3	55.4	33	14.9	4	0	

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Т	Temperature (°)			Wd Speed (mph)				
	High	Avg	Low	High	Avg	Gust	Sum		
7/25/2019	91.5	71.1	50.8	13	4.1	0	0		
7/26/2019	96.9	74.2	55.1	30	6.9	0	0		
7/27/2019	74.1	69	63.3	36	17.6	6	0		
7/28/2019	88.6	70.9	56.4	19	6.7	0	0		
7/29/2019	91	72.2	55	25	6.9	0	0		
7/30/2019	84.4	71.7	61.4	31	15.6	8	0		
7/31/2019	89	73.4	60	26	8.7	0	0		
8/1/2019	88.9	74.2	57.3	15	4.9	0	0		
8/2/2019	79.5	70.7	59.2	31	10.3	0	0		
8/3/2019	90.2	71.4	52.6	9	2.8	0	0		
8/4/2019	88.9	71.7	52	12	2.3	0	0		
8/5/2019	96.8	77.2	55.1	13	2.9	0	0		
8/6/2019	102.6	80.7	62.9	15	3.5	0	0		
8/7/2019	98.1	80.3	63	16	5.1	0	0		
8/8/2019	97.2	74.3	62.3	24	7.9	0	0		
8/9/2019	85.4	69.9	58.5	23	6.9	0	0.35		
8/10/2019	85.2	68.6	61.4	29	8.7	0	0.06		
8/11/2019	72.1	65.2	59.4	28	10.7	0	0		
8/12/2019	80.1	67.8	56.7	14	5.6	0	0		
8/13/2019	87.2	69.2	52.6	20	3.6	0	0		
8/14/2019	88.8	74	58.1	30	7.3	0	0		
8/15/2019	85.2	73.5	64.8	25	13	5	0		
8/16/2019	81	69.5	61.8	30	14.6	5	0		
8/17/2019	84.6	67.6	59.1	31	12.3	0	0		
8/18/2019	88.8	70.9	58.4	25	9.1	0	0		
8/19/2019	87.1	72.1	60.7	25	13.2	3	0		
8/20/2019	89.9	72.4	51.7	12	3.3	0	0		
8/21/2019	77.2	69.3	62.8	30	10.2	0	0		
8/22/2019	79.6	67.7	59.4	22	11.6	0	0		
8/23/2019	85.1	66.6	47.9	19	5.1	0	0		
8/24/2019	77.9	68.4	62.2	34	14.7	4	0		
8/25/2019	75.5	66.1	59	30	12.9	4	0		
8/26/2019	85.3	66.9	49.6	16	3.8	0	0		
8/27/2019	86.7	68.1	47.8	7	1.6	0	0		
8/28/2019	94.4	71.5	49.3	6	1.1	0	0		
8/29/2019	88.2	68.2	57.3	19	4.7	0	0.03		
8/30/2019	89	74.8	66	24	9.3	0 0	0.02		
8/31/2019	91 9	72.1	55.8	22	6	Õ	0		
9/1/2019	85.3	70.5	59.3	23	6.7	Õ	0		
9/2/2019	87.7	70.8	56.9	16	3.8	0	0		

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Т	Temperature (°)			Wd Speed (mph)				
	High	Avg	Low	High	Avg	Gust	Sum		
9/3/2019	86.8	68.2	52.7	30	6.4	0	0		
9/4/2019	85.1	70	56.1	14	3.2	0	0		
9/5/2019	91.4	67.5	50.9	8	1.2	0	0		
9/6/2019	85.9	69.8	60.3	9	2.3	0	0		
9/7/2019	83.3	68.8	55.6	30	4.3	0	0.02		
9/8/2019	73.3	63.8	57.6	30	13.9	2	0.21		
9/9/2019	71.9	61.1	55.6	12	5.2	0	0.03		
9/10/2019	71	60	52.2	11	2.8	0	0.02		
9/11/2019	78.3	61.4	46.7	16	3.3	0	0		
9/12/2019	80.1	64.3	48.2	13	2.9	0	0		
9/13/2019	70.3	62.8	57.7	20	11.6	2	0		
9/14/2019	70.9	61.9	55.9	23	6.1	0	0		
9/15/2019	58.7	55.1	53.1	16	2.3	0	0.07		
9/16/2019	69.1	55.7	47.6	12	2.6	0	0.07		
9/17/2019	59	51.9	43.6	13	2.9	0	0.15		
9/18/2019	65.6	55.8	47.9	12	1.7	0	0.01		
9/19/2019	72.2	57.7	46.1	20	5.5	0	0		
9/20/2019	71.9	61.7	55.7	32	12.3	2	0		
9/21/2019	78	62.2	50.9	18	7.3	0	0		
9/22/2019	69.9	57.3	47.9	15	3.7	0	0		
9/23/2019	60.4	56.4	52.2	30	11.8	2	0		
9/24/2019	67.2	58.2	47.2	25	6.6	0	0		
9/25/2019	73.9	61.5	52.2	17	4.2	0	0		
9/26/2019	69.7	60.6	53.5	29	8.9	0	0		
9/27/2019	60.4	52.4	43.3	30	9.6	0	0		
9/28/2019	49.6	42.2	35.1	10	2.2	0	0.11		
9/29/2019	43.4	40	36.8	13	2.3	0	0.04		
9/30/2019	50.3	41.9	34.8	5	1.1	0	0		
10/1/2019	59	43.5	32	13	1.9	0	0		
10/2/2019	59.5	45.4	32.4	9	1.6	0	0		
10/3/2019	61.9	49.5	39.1	6	1.2	0	0.04		
10/4/2019	59.7	48	35.9	15	3.4	0	0		
10/5/2019	60.8	52.2	44.2	15	5	0	0		
10/6/2019	65.7	48.5	32.3	6	1	0	0		
10/7/2019	71.6	50.5	37	11	1.9	0	0		
10/8/2019	56.9	46.7	38.7	20	7.2	0	0		
10/9/2019	52.6	41.2	32	9	2.4	0	0		
10/10/2019	53.5	37.5	23	13	1.5	0	0		
10/11/2019	53.9	38.4	24.2	13	1.5	0	0		
10/12/2019	52.9	39.4	26	3	0.2	0	0		

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Т	`emperature (°)	W	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum		
10/13/2019	59.8	45.5	34.7	16	2.7	0	0		
10/14/2019	60.5	46.2	31.7	8	1.7	0	0		
10/15/2019	52.6	43.3	33.2	4	0.4	0	0		
10/16/2019	53	46.5	41.3	6	0.9	0	0.02		
10/17/2019	58.7	50	41.2	9	2.4	0	0.04		
10/18/2019	56.9	46.2	39.5	14	2.6	0	0		
10/19/2019	46.6	42.2	39.4	21	6.3	0	0.47		
10/20/2019	47.9	42.2	38.5	12	3.1	0	0		
10/21/2019	49.6	45.3	40	4	0.4	0	0.05		
10/22/2019	58.5	51	40.6	22	7.9	0	0.01		
10/23/2019	60.5	47.5	35.7	9	1.5	0	0		
10/24/2019	64.7	46.8	32.8	4	0.5	0	0		
10/25/2019	65.9	47.5	37.1	27	6.2	0	0		
10/26/2019	52.5	44.4	35.7	14	5.8	0	0		
10/27/2019	52.5	38.8	28.8	8	1.7	0	0		
10/28/2019	53.9	37.8	27.7	14	3.7	0	0		
10/29/2019	36.4	28.8	19.3	12	3.5	0	0		
10/30/2019	43.5	27.0	15.1	3.0	0.1	0.0	0		
11/1/2019	52.7	34.4	20.5	6	0.7	0	0.00		
11/2/2019	54.4	36.5	23.3	4	0.4	0	0.00		
11/3/2019	55.3	38.5	26.4	4	0.2	0	0.00		
11/4/2019	58.3	40.4	28	4	0.4	0	0.00		
11/5/2019	60.1	39.5	25.6	5	0.5	0	0.00		
11/6/2019	58	39.2	26	14	1.4	0	0.00		
11/7/2019	52.5	36.8	24.5	4	0.3	0	0.00		
11/8/2019	44.3	33.4	25.2	3	0.3	0	0.00		
11/9/2019	53	41.6	29.5	16	1.6	0	0.05		
11/10/2019	62.3	50.7	42.8	14	3.1	0	0.00		
11/11/2019	53	41.3	32	7	0.9	0	0.00		
11/12/2019	55	40.7	30.1	9	1.3	0	0.00		
11/13/2019	45	38.5	33.9	9	1.5	0	0.00		
11/14/2019	41.7	39.3	36.7	2	0.2	0	0.00		
11/15/2019	49	43.7	38.9	9	1.4	0	0.00		
11/16/2019	51.3	43.2	33	6	0.7	0	0.00		
11/17/2019	62.2	50	39.3	21	4.7	0	0.00		
11/18/2019	48.9	41.1	36.4	6	1	0	0.03		
11/19/2019	53	42.9	35.8	14	3.1	0	0.01		
11/20/2019	53	38.5	27.2	6	0.9	0	0.00		
11/21/2019	47	31.6	20.9	5	0.7	0	0.00		
11/22/2019	44.9	28.6	18.7	4	0.1	0	0.00		

Weather History for Ellensburg, WA [KWAELLEN22]										
Date	Т	emperature (°)	W	Precip. Daily (in)					
	High	Avg	Low	High	Avg	Gust	Sum			
11/23/2019	44.9	33	23.5	12	0.9	0	0.00			
11/24/2019	49.5	44.6	36.2	27	9.6	0	0.00			
11/25/2019	44.7	37.2	31	20	4.6	0	0.00			
11/26/2019	34.4	28.9	20.3	12	2.8	0	0.00			
11/27/2019	35.6	32.3	29.3	15	3.6	0	0.01			
11/28/2019	32.5	27.4	17.5	5	0.8	0	0.00			
11/29/2019	33.1	20	10.8	4	0.4	0	0.00			
11/30/2019	32.9	19.3	10	4	0.3	0	0.00			
12/1/2019	29.7	24.4	16.9	5	0.4	0	0.03			
12/2/2019	25.2	23	19.6	4	0.5	0	0			
12/3/2019	29.7	25.4	20.6	4	0.2	0	0.01			
12/4/2019	34.4	29.9	24.2	5	0.4	0	0.02			
12/5/2019	38.9	35.8	32.7	4	0.2	0	0.01			
12/6/2019	41.6	38.2	36	5	0.2	0	0.03			
12/7/2019	41	37.4	34.8	5	0.6	0	0.15			
12/8/2019	38.9	34.6	29.1	5	0.7	0	0.01			
12/9/2019	30.7	28.4	25.6	5	0.5	0	0			
12/10/2019	31	29.9	28.5	6	0.9	0	0.01			
12/11/2019	32.1	30.6	29.2	6	1.1	0	0.06			
12/12/2019	31.3	27.6	23.6	5	0.7	0	0			
12/13/2019	38.5	31.8	24.9	6	0.6	0	0.15			
12/14/2019	30.8	26.7	22.3	3	0.2	0	0.01			
12/15/2019	36.9	29.9	23.1	9	1	0	0.01			
12/16/2019	32.2	23.9	15.5	4	0.5	0	0			
12/17/2019	26.8	25.4	23.9	4	0.6	0	0			
12/18/2019	29.1	26.3	24.8	3	0.5	0	0			
12/19/2019	31	28.6	26.5	7	0.6	0	0			
12/20/2019	38.7	32.9	29.6	2	0.1	0	0.49			
12/21/2019	40.9	37	33.3	21	4.1	0	0.02			
12/22/2019	39.1	35.6	34.3	5	0.3	0	0.04			
12/23/2019	41.5	35.8	32.6	5	0.8	0	0.01			
12/24/2019	39.3	31.7	28	3	0.1	0	0			
12/25/2019	36.1	31.5	27.7	4	0.4	0	0			
12/26/2019	30.3	27.7	23.9	4	0.3	0	0			
12/27/2019	34	30.3	27.4	4	0.5	0	0.01			
12/28/2019	32.9	30.7	27.7	6	1.4	0	0			
12/29/2019	32.7	31.5	30	7	0.9	0	0			
12/30/2019	36.3	32.9	30.5	5	0.5	0	0			
12/31/2019	38.5	34.3	31.3	6	0.8	0	0.24			
1/1/2020	49.1	42	33.2	23	8.3	0	0.03			

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Т	`emperature (°)	W	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum		
1/2/2020	42.8	37.5	32.8	32	7.6	0	0.04		
1/3/2020	33.2	31.2	28.9	5	0.1	0	0		
1/4/2020	43.4	37.2	29.9	22	6.8	0	0.01		
1/5/2020	42.3	33.6	29.1	14	2.9	0	0		
1/6/2020	43.7	37.1	31.7	11	2.7	0	0		
1/7/2020	44.9	38	31.8	7	1.3	0	0.01		
1/8/2020	40.3	36.5	31.2	20	6.7	0	0		
1/9/2020	39	32.6	27.7	16	4	0	0		
1/10/2020	31.8	28.9	26	5	0.8	0	0.03		
1/11/2020	43.8	34.5	28.1	25	5	0	0.03		
1/12/2020	38.4	31.2	26.2	15	3.5	0	0		
1/13/2020	29.2	22.8	14.9	22	8.6	0	0		
1/14/2020	25.1	16.9	11.2	6	1.6	0	0.05		
1/15/2020	20.6	15.2	9.6	12	1.6	0	0		
1/16/2020	28.2	21.9	15	5	0.6	0	0.04		
1/17/2020	26	17.5	6.6	4	0.6	0	0		
1/18/2020	32.6	28.3	22	3	0.1	0	0.01		
1/19/2020	38	32.2	27.8	4	0.6	0	0.07		
1/20/2020	38.3	31.8	27.9	5	0.4	0	0		
1/21/2020	39.7	32.5	27.5	6	0.9	0	0.04		
1/22/2020	34	30.9	26.2	4	0.6	0	0.09		
1/23/2020	36.4	34.5	33	4	0.2	0	0.09		
1/24/2020	39.3	35.5	32	4	0.5	0	0.02		
1/25/2020	42.2	34.9	31.4	9	0.7	0	0.15		
1/26/2020	50.1	39.5	33.2	7	1	0	0.04		
1/27/2020	47.6	36.9	30.9	6	1.7	0	0.44		
1/28/2020	43.3	36.2	31.8	6	1.1	0	0.03		
1/29/2020	42.4	34.7	31.2	6	0.6	0	0		
1/30/2020	43.4	34.1	26.2	5	1.1	0	0		
1/31/2020	56.8	42.8	31.1	12	2.4	0	0.01		
2/1/2020	55.8	45.7	33	25	10.8	0	0.02		
2/2/2020	41.3	33.3	28.2	13	4.5	0	0		
2/3/2020	41.9	30.2	21	18	3.5	0	0		
2/4/2020	32.6	27.5	21.2	5	0.8	0	0		
2/5/2020	49.9	39.5	29.4	28	6.7	0	0.02		
2/6/2020	47.1	43.9	41.2	15	5.7	0	0.24		
2/7/2020	49.3	43.4	36.1	17	4.4	0	0.11		
2/8/2020	46.8	38.4	31.9	24	7.8	0	0.01		
2/9/2020	47	37.8	27.1	27	5.2	0	0		
2/10/2020	54.3	39.3	31.2	12	2.2	0	0		

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Temperature (°)			W	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum		
2/11/2020	47.9	39.6	30.3	33	10.2	0	0		
2/12/2020	53.2	40.5	29.4	12	2	0	0		
2/13/2020	45.8	34.5	25.2	14	3.4	0	0		
2/14/2020	45.5	37.4	29.6	22	6.3	0	0		
2/15/2020	46.2	38.9	33.1	8	2.4	0	0		
2/16/2020	45.4	38.4	32.3	28	10.5	0	0		
2/17/2020	42.5	35.4	28.2	23	9.2	0	0.1		
2/18/2020	46.6	30.5	20.5	7	1.6	0	0		
2/19/2020	44.6	29.9	18	11	2.2	0	0		
2/20/2020	47.5	31.3	18.3	9	1.2	0	0		
2/21/2020	49.4	32.7	20	6	0.8	0	0		
2/22/2020	51.6	38.8	26.5	24	7.1	0	0		
2/23/2020	46.6	37.5	31.4	17	4.7	0	0.08		
2/24/2020	43.5	37.6	32.8	28	12.3	0	0		
2/25/2020	51.3	38.1	26.7	11	1.6	0	0		
2/26/2020	52.4	42.4	33.4	35	8.2	0	0		
2/27/2020	63.4	46.5	32.9	15	2.8	0	0		
2/28/2020	62.3	42.9	29.9	23	4.3	0	0		
2/29/2020	46.8	37.1	29	34	9.3	0	0		
3/1/2020	47.2	37.5	30	24	12	0	0		
3/2/2020	51.7	44	37.1	30	14.6	0	0		
3/3/2020	57.7	48.1	42.2	31	11.7	0	0		
3/4/2020	51.5	42.8	34.9	29	10.3	0	0		
3/5/2020	58.1	41.2	28.1	12	3.3	0	0		
3/6/2020	53.6	42.8	32.1	15	4.6	0	0		
3/7/2020	50.6	40.3	33.9	16	6.4	0	0.01		
3/8/2020	49.5	37.5	25.2	17	5.4	0	0		
3/9/2020	54.5	38.4	21.7	16	3	0	0		
3/10/2020	54.2	38.7	26.8	24	4.2	0	0		
3/11/2020	48.3	43.2	34.9	40	12.2	0	0		
3/12/2020	51.6	39.9	28	27	7.5	0	0		
3/13/2020	35.9	33.5	30.8	14	1.3	0	0.24		
3/14/2020	33.7	30	25.2	19	6.9	0	0		
3/15/2020	44	29.9	18.3	11	2.2	0	0		
3/16/2020	53.2	36.2	21.3	10	2.2	0	0		
3/17/2020	54.9	37.6	21.4	11	2.1	0 0	0		
3/18/2020	60.9	41.8	25.4	8	2	0 0	0		
3/19/2020	597	42.4	27.5	12	- 1	Õ	0 0		
3/20/2020	64 4	47.5	30.3	16	13	Õ	0		
3/21/2020	65	49.2	32.3	19	3.3	0	0		

Weather History for Ellensburg, WA [KWAELLEN22]									
Date	Temperature (°)			W	Precip. Daily (in)				
	High	Avg	Low	High	Avg	Gust	Sum		
3/22/2020	61.4	46.6	29.1	3	0.1	0	0		
3/23/2020	53.8	44	34.5	1	0	0	0		
3/24/2020	46.5	35.4	25	14	0.9	0	0		
3/25/2020	52	39.6	33.2	5	0.1	0	0		
3/26/2020	47.8	39.2	26.9	23	6.6	0	0		
3/27/2020	53.2	44.4	39.1	19	4.9	0	0		
3/28/2020	58	45.7	34.9	11	0.8	0	0		
3/29/2020	58.2	46.7	38.6	17	1.9	0	0		
3/30/2020	50.7	42.5	31.8	20	4.5	0	0.01		
3/31/2020	48.5	38.5	31.3	31	3.4	0	0.03		
4/1/2020	46.6	38.3	32.2	9	0.3	0	0.01		
4/2/2020	49.9	36.2	22.2	0	0	0	0		
4/3/2020	46	38.3	31.6	20	1.8	0	0		
4/4/2020	48.1	38.3	26.7	17	2.3	0	0		
4/5/2020	55	42.4	34.2	14	2.1	0	0		
4/6/2020	60.3	41.8	28.2	27	3.1	0	0		
4/10/2020	67	59.5	54.1	28	13.4	5	0		
4/11/2020	60.1	51.9	43.4	27	9.5	0	0		
4/12/2020	54.9	45.4	35	11	0.6	0	0		
4/13/2020	64.4	46.5	27.3	4	0.1	0	0		
4/14/2020	65.4	55.3	45.3	18	0.2	0	0		
4/15/2020	64.4	52.6	40.1	17	0.2	0	0		
4/16/2020	63.6	47.3	30.6	0	0	0	0		
4/17/2020	73	51.9	29.5	0	0	0	0		
4/18/2020	65.4	55.2	47	0	0	0	0		
4/19/2020	71.9	55.8	44.9	0	0	0	0		
4/20/2020	74.7	55.6	36.9	23	2.5	0	0		
4/21/2020	61.2	53	47.9	31	7.2	0	0		
4/22/2020	59	49.4	44.5	0	0	0	0.12		
4/23/2020	61	51.7	44.2	20	3.7	0	0		

Appendix M Audit Results

June 2018 Audit

Auditor name: Taylor Hoffman-Ballard		Date: 6/19/2018
Field staff name(s): Bryan, Glen, Gordon		Time: 9am
	Actions	Comments:
	Compliant	
Standard Operating Procedure (SOP)	with SOPs?	
	Overall SOP	audit notes:
Measuring Catch Basin Sediment Depth		1
Prior to cleaning, 5 depth to sediment measurements collected in different spots	√	Use lath, measure from top of rim so its easier to see value on lath
Depth to sediment measurements recorded	√	
Following cleaning, 5 depth to CB floor measurements collected in different spots	✓	
Depth to CB floor measurements recorded	✓	
	Overall SOP audit notes:	
Catch Basin Sediment Collection		
Prior to start, vactor truck debris tank is clean	\checkmark	Hoses which collect sediment are flushed too
Material on grate rim washed into catch basin sump	\checkmark	
Material adhered to walls washed into catch basin sump	✓	
All material and water removed from catch basin	✓	
Typical catch basin cleaning procedures followed overall	✓	
Flushed residual sediment in outlet pipe to swale	\checkmark	
Cleaning occurred for all CBs on both sides of street (test and control)	✓	
Material from CBs on each side of street placed into separate basins	\checkmark	
		Empty all sediment by rinsing out the tank with water; note: any sediment
		which misses the basin is allowed to dry on concrete decant facility floor, then
Emptied all sediment from vactor truck into respective basin	\checkmark	is scooped/shoveled into respective basin
Vactor truck debris tank cleaned	\checkmark	
	Overall SOP	audit notes:
Roadway Sediment Collection		
Prior to start, sweeper debris tank is clean	\checkmark	
Sweeping occurs as typically done on test side of street only (except in April)	\checkmark	
Full length of study site swept	\checkmark	
		Empty all sediment by rinsing out the tank with water; note: any sediment
		which misses the basin is allowed to dry on concrete decant facility floor, then
Emptied all sediment into respective basin (each side into separate basin in April)		is scooped/shoveled into respective basin
Sweeper debris tank cleaned	\checkmark	

	Actions	Comments:
	Compliant	
Standard Operating Procedure (SOP)	with SOPs?	
	Overall SOP	audit notes:
Catch Basin Sediment Washout Collection		
Sock tare weight obtained prior to installation	✓	Use scale to ±2g accuracy
Sock labeled and label matches respective upstream catch basin	\checkmark	
Observe and note any tears, holes, etc. in sump sock	\checkmark	
Sock sealed and placed in labeled plastic bag	\checkmark	
Clean sock installed immediately following removal of previous sock	~	
Tare weight of clean sock obtained prior to installation	~	
COC filled out	✓	
Procedures followed for each sump	✓	
	Overall SOP	audit notes:
Dewatering and Weighing Sediment Samples		
Prior to start, basins are clean	~	
		Because waited 1 week filter fabric was not used for the top three rows of
Inspected filter fabric prior to placing sediment in basins	change	valves, as suggested in the alternative for the dewatering SOP.
Tare weight of basins plus pallets obtained prior to placing sediment in basins	✓ ✓	
Roadway and CB sediment allowed to settle for minimum of 1 hour	✓	Waited 1 week to allow for settling
		Followed the alternative dewatering SOP (wait 7 days to dewater) and open
Dewater according to SOP (20 minutes wait following each valve row)	change	valves from top to bottom without waiting 20 minutes between valves.
Wet weight of sediment, basin, and pallet obtained for each basin	<u>√</u>	
Tare weights and wet weights recorded on appropriate form	✓	
Samples taken after weighing of sediment	\checkmark	
	Overall SOP	audit notes:
Sample Collection and Handling: Moisture Content, Organic Content, and PSD		
Bowl and scoop washed with soap and water/cleaned and dried	✓	
Collected samples in 3-6 random locations several inches below surface	✓	
Homogenized sediment collected in bowl	√	
Filled appropriate sample containers using homogenized sediment samples	√	
Procedures followed for each basin	✓	
COC filled out	✓	
All basins emptied, cleaned, and dried	✓	

	Actions	Comments:	
	Compliant		
Standard Operating Procedure (SOP)	with SOPs?		
	Overall SOP	audit notes:	
Inspection of Study Area for Damage or Vandalism			
Inspections conducted once per week	√		
Visually inspected inside of catch basin for spills or illicit discharges	✓		
Visually inspected sump for damage or vandalism	\checkmark		
Record any incidents and the date of inspection	\checkmark	No incidents so far	
Maintain record of incidents during the study	√	No incidents so far	
Create pdf copies of inspections once per month and email to Project Manager	\checkmark	No incidents so far	
	Overall SOP	Overall SOP audit notes:	
Calibration and Maintenance of Equipment: Scale and Weather Station			
Obtained records of maintenance and calibration activities from Direct TV, Inc.		Gordon to obtain from Direct TV	
Obtained records of maintenance and calibration activities from scale vendor	\checkmark		
	Overall SOP	Overall SOP audit notes:	
Maintenance of Street Sweeper and Vactor Truck			
Records of maintenance activities maintained		Gordon to email	
PDF copies of records will be emailed to Project Manager		Gordon to email	

Ellensburg Street Sweeping, CB Cleaning, and Sampling Event – June 19th, 2018





Sump sock for CB 4 shown above. Sump sock was removed and placed in a bag for dry weight and PSD sampling. Sediment accumulation reflects washout from the catch basin upstream between the April sampling event and June 19th.





The same sump sock is shown next to the sump basin from which it was removed. The inside of the outlet pipe is coated in the same sediment as was in the sock. Care was taken not to lose any of the sediment in the pipe when removing the sock.



The photo above shows the removed sock with "Test CB4 270 gr" written on the sock. 270 grams is the clean/tare weight of the sock prior to when it was installed.


The above two pictures display the new clean sock being installed. The sock is folded and placed in the sump box, and gorilla tape/duct tape is placed around the plastic ring and across the cut in the sock (done intentionally to get the sock onto the pipe). The sock fits tightly onto the pipe.



Photo of a closed sump box at the site and the upstream/area across the street



Picture of sweeper on the test side of the road (north)



Picture of the road after swept



Material left behind after sweeper completed sweeping at site (just beyond crown/end of contributing basin) and lifted vacuum head below truck to drive away





First photo shows the decant facility and basins with sweeper truck on the left and vactor truck on the right. Second photo shows the sweeper operator spraying out the inside of the debris tank to remove any remaining sediment inside the tank.



Photo shows street sweeping solids plus water used to wash out debris tank. Sediment on the decant facility floor (from emptying the sweeper debris tank) is typically allowed to dry and is scooped/shoveled into the basin with the rest of the sediment to minimize losses. Was told this amount is about 1/3 of what was collected from sweeping in April.



Another picture showing what was collected during the street sweeping. Slight sheen (possibly biological from breakdown of hay?) and hay chaff was observed.



Material collected during catch basin cleaning. Appeared to fill the basin to almost the same depth as in April. Smelled horrible. No dead mice observed.

August 2019 Audit

Auditor name: Taylor Hoffman-Ballard		Date: 8/28/2019	
Field staff name(s): Bryan, Glen, Gordon		Time: 9am	
Standard Operating Procedure (SOP)	Actions Compliant with SOPs?	Comments:	
Measuring Catch Basin Sediment Depth	Overall SOP	audit notes:	2018 Previous Audit Respo
Prior to cleaning, 5 depth to sediment measurements collected in different spots	\checkmark		Use lath, measure from to
Depth to sediment measurements recorded	✓		
Following cleaning, 5 depth to CB floor measurements collected in different spots	✓		
Depth to CB floor measurements recorded	\checkmark		
Catch Basin Sediment Collection	Overall SOP	audit notes:	2018 Previous Audit Respo
Prior to start, vactor truck debris tank is clean	✓		Hoses which collect sedimen
Material on grate rim washed into catch basin sump	NA	Typically no material on rim - whatever is present is blown into catch basin when Gordon lifts the grate to measure depth the day before catch basin cleaning	
Material adhered to walls washed into catch basin sump	\checkmark		
All material and water removed from catch basin	\checkmark		
Typical catch basin cleaning procedures followed overall	\checkmark		
Flushed residual sediment in outlet pipe to swale	\checkmark		
Cleaning occurred for all CBs on both sides of street (test and control)	\checkmark		
Material from CBs on each side of street placed into separate basins	✓		
Emptied all sediment from vactor truck into respective basin Vactor truck debris tank cleaned	✓ ✓		Empty all sediment by rinsin sediment which misses the b facility floor, then is scooped
Roadway Sediment Collection	Overall SOP	audit notes:	2018 Previous Audit Respo
Prior to start, sweeper debris tank is clean	\checkmark		
Sweeping occurs as typically done on test side of street only (except in October)	✓		
Full length of study site swept	\checkmark		
Emptied all sediment into respective basin (each side into separate basin in October)	✓		Empty all sediment by rinsin sediment which misses the be facility floor, then is scooped
		Will do in October, not applicable this month because only cleaning test	
Sweeper debris tank cleaned	NA	side	

ious Audit Responses

, measure from top of rim so its easier to see value on lath

ious Audit Responses

ch collect sediment are flushed too

sediment by rinsing out the tank with water; note: any which misses the basin is allowed to dry on concrete decant or, then is scooped/shoveled into respective basin

rious Audit Responses

sediment by rinsing out the tank with water; note: any which misses the basin is allowed to dry on concrete decant or, then is scooped/shoveled into respective basin

	Actions	Comments:	
	Compliant		
Standard Operating Procedure (SOP)	with SOPs?		
Catch Basin Sediment Washout Collection	Overall SOP	audit notes:	2018 Previ
Sock tare weight obtained prior to installation	✓		Use scale to
Sock labeled and label matches respective upstream catch basin	\checkmark		
Observe and note any tears, holes, etc. in sump sock	✓	Have never seen any tears, holes, etc. One time have seen duct tape off of the pipe and sock when the sump was opened, but the sock was still on the pipe.	
Sock sealed and placed in labeled plastic bag	\checkmark		
Clean sock installed immediately following removal of previous sock	✓		
Tare weight of clean sock obtained prior to installation	✓		
COC filled out	✓		
Procedures followed for each sump	✓		
Dewatering and Weighing Sediment Samples	Overall SOP	audit notes:	2018 Previ
Prior to start, basins are clean	✓	The vactor truck is used to vacuum out any residual sediment, and the pressure hose on the vactor truck is used as needed to wash off any sediment	
Inspected filter fabric prior to placing sediment in basins	NA	See previous Audit Response, still following change from June 2018	Change: B three rows SOP.
Tare weight of basins plus pallets obtained prior to placing sediment in basins	~	Main difference between tare weights is due to differences in construction of pallets, adds up to a few pounds	
Roadway and CB sediment allowed to settle for minimum of 1 hour		Change: See previous Audit Response, typically allow 5-7 days to dewater	Change: W
Dewater according to SOP (20 minutes wait following each valve row)		Change: See previous Audit Response, typically allow 5-7 days to dewater	Change: Fo dewater), an minutes bet
Wet weight of sediment, basin, and pallet obtained for each basin	✓		
Tare weights and wet weights recorded on appropriate form	✓		
Samples taken after weighing of sediment	✓		
Sample Collection and Handling: Moisture Content, Organic Content, and PSD	Overall SOP	audit notes:	2018 Previ
Bowl and scoop washed with soap and water/cleaned and dried		Change: Use disposable gloves to scoop material directly into sample jars	
Collected samples in 3-6 random locations several inches below surface	NA	Change: Since homogenize full basin of material (see note below), not applicable	
Homogenized sediment collected in bowl		Change: To homogenize, all material is mixed within the basin using a metal shovel	
Filled appropriate sample containers using homogenized sediment samples	\checkmark		
Procedures followed for each basin	\checkmark		
COC filled out	\checkmark		
All basins emptied, cleaned, and dried	\checkmark		

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to ±2g accuracy

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Because waited 1 week, filter fabric was not used for the top of valves, as suggested in the alternative for the dewatering

Vaited 1 week to allow for settling

Followed the alternative dewatering SOP (wait 7 days to and open valves from top to bottom without waiting 20 etween valves.

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Standard Operating Procedure (SOP)	Actions Compliant with SOPs?	Comments:	
Inspection of Study Area for Damage or Vandalism	Overall SOP	audit notes:	2018 Previ
Inspections conducted once per week		Change: Driving by every other week - have not seen much foot traffic around site. Looking for obvious signs of damage or vandalism when inspect	
Visually inspected inside of catch basin for spills or illicit discharges		Change: Driving by every other week - have not seen much foot traffic around site. Look inside of catch basins during depth measurements day before sample collection day. Have not observed any spills or discharges	
		Change: Driving by every other week - have not seen much foot traffic around site. Looking for obvious signs of damage or vandalism when	
Visually inspected sump for damage or vandalism		inspect	
Record any incidents and the date of inspection	✓	No incidents so far	No incident
Maintain record of incidents during the study	\checkmark	No incidents so far	No incident
Create pdf copies of inspections once per month and email to Project Manager	\checkmark	No incidents so far	No incident
Calibration and Maintenance of Equipment: Scale and Weather Station	Overall SOP	audit notes:	2018 Previ
Obtained records of maintenance and calibration activities from Direct TV, Inc.	✓	Gordon to call and request records	Gordon to c
Obtained records of maintenance and calibration activities from scale vendor	\checkmark	Gordon to request records	
Maintenance of Street Sweeper and Vactor Truck	Overall SOP	audit notes:	2018 Previ
Records of maintenance activities maintained	~	Have these in a spreadsheet; need to contact new manager of spreadsheet for a copy	Gordon to e
PDF copies of records will be emailed to Project Manager	√	Gordon to send copies of records	Gordon to e

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Appendix N Equipment Maintenance Records

135 - 2012 International 7600 -	Date of Service	Date Task	Hours (vac		Commission from the second	Marchaniala Tanka	Mechanic
Vactor truck	Order	Completed	engine)	Odometer	Complaint/issue		Name
135	3/12/2018	3/21/2018			blower motor in cab not working.	Checked blower. Checked circuit breaker. Both OK and working.	
135	8/22/2018	8/22/2018	2700			Service call for transmission range inhibited.	
135	8/28/2018					scanned truck and found a code for low voltage or mis-communication between the transmission and the computer. Could not find the problem at this time.	Bryan
135	8/28/2018					Replaced the radiator and air cooler.	Tyge
135	12/4/2018	12/4/2018	2843		Hydraulic functions work intermittently.		
135	12/27/2018					Found a bad wire in the lower valve loom. By-passed wire and ordered a new loom.	
135	12/27/2018					Ordered a New Set of Bearings For Fan Shaft and Idler Pulley	
135	2/6/2019	2/6/2019	2,875			Side wall assembly, routine servicing	
135	4/30/2019	5/7/2019	3,044	15,825		heater & A/C unit	
135	6/27/2019	7/15/2019	3,044	15,825		routine servicing	
135	6/27/2019	7/8/2019	3,044	18,000		air to air boot replacement	KA
135A	5/11/2018	5/11/2018	2,594		Needs forced re-gen.	Went to treatment plant and found exhaust 100% plugged. Did 3 forced re-gens to get down to 5%.	КА
135A	5/11/2018	5/14/2018	2,601			routine servicing	TT
135A	8/22/2018	8/22/2018				Radiator is leaking.	
135A	1/15/2019	1/18/2019			Vacuum door would not open.	Found a bad relay for the hydraulic valve that opens the door. Replaced with a used relay.	
135A	2/6/2019	2/7/2019	2,889			routine servicing	
135A	3/27/2019	3/29/2019				Power shaft assembly	

160 - 2016 Freightliner M2 -	Date of Service	Date Task	Hours (vac	Odemeter	Complaint/Jacua	Mashaviala Taska	Mechanic
Street Sweeper	Order	Completed	engine)	Odometer	Complaint/issue		Name
161	2/9/2018	2/9/2018				Added air line and did pre season check. Prime water pump.	
160	4/19/2018	4/19/2018			Service call. No throttle or fuel gauge.	Went to Manitoba and Pine and switched back to right side controls.	
160	4/19/2018	4/19/2018			Leaking hydraulic oil.	Tightened fitting on bottom of lift cylinder.	
161	6/28/2018	7/2/2018			A/C needs to be recharged	Replaced cabin air filter	
160	7/16/2018	7/16/2018			Check fan for noise.	Steam cleaned fan and housing. OK at this time.	Glen
160	7/18/2018					Check noise in sweeper, found fan bearings going bad.	JM
160	7/18/2018					Fan Bearing	КА
160	7/18/2018	7/18/2018				Washed out fan on blower, installed new mirrors	TT
160	7/18/2018	7/23/2018				Found fan bearings failing also found air blocker air solenoid needed repair. Changed out fan bearings, idler pulley bearings, fan belt and repaired air solenoid for air blocker.	Glen
160	7/23/2018	7/23/2018		8,256		routine servicing	КА
160	8/1/2018	8/1/2018				Found inner fan bearing had too much play. Replaced inner fan brearing. Installed another shim in the idler pulley.	Glen
160	8/22/2018	8/22/2018				routine servicing	Rodney
160	8/23/2018	8/23/2018				Replaced curtain set in head. Weld worn latches on hopper door lock.	Jack
160	10/2/2018	10/2/2018				Serviced and tightened fan belt.	Glen
160	10/11/2018	10/11/2018				Changed brooms.	Glen
160	10/16/2018	10/16/2018				Rocker switch on rear bumper replaced.	Glen
160		10/28/2018				routine servicing	JM
160		12/28/2018		10,696		routine servicing	КА
160	5/14/2019	5/16/2019		11,675		routine servicing	
160	9/26/2019	9/26/2019				routine servicing	
160A	7/23/2018	7/23/2018	1,565			routine servicing	KA
160A	7/27/2018	7/27/2018	1,572		Fan making a clunking sound.		JM
160A	10/1/2018	10/2/2018	1,728			routine servicing	КА
160A		10/28/2018				routine servicing	JM
160A		12/28/2018	1,884			routine servicing	КА
160A	1/11/2019	1/11/2019	1,959			replace broom assembly	
160A	4/18/2019	4/18/2019	1,959			replace sweeping unit	
160A	5/14/2019	5/17/2019	2,022			routine servicing	
160A	6/10/2019	6/10/2019				replace sweeping unit	
160A	7/11/2019	7/15/2019				replace broom assembly	
160A	7/16/2019		2,156			dust supression	
160A		9/26/2019				Replaced wandering hose switch and built dummy plug for next time.	
160A	9/26/2019	9/26/2019				routine servicing	

161 - 2016 Elgin Crosswind -	Date of Service	Date Task	Hours (vac	Odernstein	Commission (Income	Marchaniele Tarles	Mechanic
Street Sweeper	Order	Completed	engine)	Odometer	Complaint/issue		Name
161	7/18/2018	8/20/2018	1,547	5,280		Pick up hood needs new curtains.	КА
161	7/26/2018					Needs a new back up alarm.	КА
161	8/2/2018					Replaced light with LED. Replaced broken hose to tank	Glen
161	8/16/2018	8/20/2018	1,547	5,280		Hood needs new curtains.	КА
161	8/16/2018	8/20/2018	1,547	5,280		Service due.	КА
161	8/22/2018					Serviced engine.	Rodney
161		10/12/2018				Replaced back up alarm.	Jack
161	11/5/2018	11/5/2018	Service call for broken clevis on hood pick up chain.	JM			
161	11/27/2018	11/27/2018				Hood lift cylinder clevis broke.	JM
161	12/3/2018	12/31/2018	1,799	6,457		routine servicing	КА
161	4/18/2019	4/18/2019	1,959	7,254		replace sweeping unit	
161	5/14/2019	5/17/2019	2,043	7,793		routine servicing	
161		9/26/2019		9,288		routine servicing	
161A	8/1/2018	8/2/2018				Right gutter broom light is out, Fill hose to rear tank is leaking.	КА
161A	8/16/2018	8/20/2018				Service due.	КА
161A	12/3/2018	12/31/2018				routine servicing	КА
161A	5/14/2019	5/17/2019	2,043			replace broom assembly	
161A	5/30/2019	6/3/2019	2,049			replace coupling	
161A	7/18/2019	8/1/2019				replace shared power hydraulic motor fitting	
161A		9/26/2019				replace broom assembly	
161A	161A 9/26/2019				routine servicing		
161A	161A 10/29/2019 10,					routine servicing	

Appendix O Relative Percent Difference Results

Catch Basin Sediment %RPD

Data C	ollection Dat	te														
Day	Month	Year	Data Collection Date	Tub Contents	Sediment Moisture Content (%) #1	Sediment Moisture Content (%) #2	Sediment Moisture Content (%) #3	Average Moisture Content (%)	Moisture Content %RPD	Sediment Wet Weight	Sediment Dry Weight (lb) #1	Sediment Dry Weight (Ib) #2	Sediment Dry Weight (Ib) #3	average dry weight (Ibs)	Sediment Dry Weight %RPD	std deviation (Ibs)
6	10	2017	Oct-17													
6	10	2017	Oct-17													
20	4	2018	Apr-18 Apr-18	CB Clean-Test Side												
19	6	2018	Jun-18	CB Clean-Test Side	27.8	29.5	20.5	25.93	34.7%	34	26.60	26.25	28.22	27.02	7.3%	1.05
19	6	2018	Jun-18	CB Clean-Control Side	23.1	40.9	45	36.33	60.3%	50	40.94	35.77	34.76	37.16	16.6%	3.32
22	8	2018	Aug-18	CB Clean-Test Side	56.8	45.4	61	54.40	28.7%	28	18.05	19.46	17.58	18.36	10.3%	0.98
22	8	2018	Aug-18	CB Clean-Control Side	42.6	41.7	62.4	48.90	42.3%	41	28.96	29.15	25.43	27.85	13.3%	2.09
24	10	2018	Oct-18	CB Clean-Test Side	43.3	37.9	46.9	42.70	21.1%	73	50.80	52.79	49.56	51.05	6.3%	1.63
24	10	2018	Oct-18	CB Clean-Control Side	64.4	58.5	48.1	57.00	28.6%	60	36.50	37.85	40.51	38.29	10.5%	2.04
25	4	2019	Apr-19	CB Clean-Test Side	45.6	43.7	36.2	41.83	22.5%	125	85.85	86.99	91.78	88.21	6.7%	3.14
25	4	2019	Apr-19	CB Clean-Control Side	42.5	29.3	40.8	37.53	30.6%	69	48.42	53.36	49.01	50.26	9.8%	2.70
24	6	2019	Jun-19	CB Clean-Test Side	35	39.5	38.9	37.80	11.9%	77	57.04	55.20	55.44	55.89	3.3%	1.00
24	6	2019	Jun-19	CB Clean-Control Side	1.9	2.5	3.3	2.57	54.5%	22	21.59	21.46	21.30	21.45	1.4%	0.15
27	8	2019	Aug-19	CB Clean-Test Side	43.5	32.6	36.1	37.40	29.1%	59	41.11	44.49	43.35	42.99	7.9%	1.72
28	8	2019	Aug-19	CB Clean-Control Side	7.9	17.3	6	10.40	108.7%	53	49.12	45.18	50.00	48.10	10.0%	2.56
29	10	2019	Oct-19	CB Clean-Test Side	54.1	63.6	50.2	55.97	23.9%	50	32.45	30.56	33.29	32.10	8.5%	1.40
29	10	2019	Oct-19	CB Clean-Control Side	42.5	56.7	47.5	48.90	18.8%	24	16.84	15.32	16.27	16.14	9.5%	0.77

Street Sweeper Sediment %RPD

Day	Month	Year	Data Collection Date	Tub Contents	Sediment Moisture Content (%) #1	Sediment Moisture Content (%) #2	Sediment Moisture Content (%) #3	Average Moisture Content (%)	Moisture Content %RPD	Sediment Wet Weight	Sediment Dry Weight (lb) #1	Sediment Dry Weight (Ib) #2	Sediment Dry Weight (lb) #3	average dry weight (Ibs)	Sediment Dry Weight %RPD	std deviation (Ibs)
6	10	2017	Oct-17													
6	10	2017	Oct-17													
20	4	2018	Apr-18	Sweeper-Test Side												
20	4	2018	Apr-18	Sweeper-Control Side												
19	6	2018	Jun-18	Sweeper-Test Side	6.3	5.2	6	5.83	18.9%	164	154.37	155.99	154.81	155.06	1.0%	0.83
22	8	2018	Aug-18	Sweeper-Test Side	16.2	15.3	15.8	15.77	5.7%	156	133.91	134.95	134.37	134.41	0.8%	0.52
24	10	2018	Oct-18	Sweeper - Test Side	15.8	25.6	16.1	19.17	51.1%	132	114.08	105.18	113.78	111.01	8.0%	5.06
24	10	2018	Oct-18	Sweeper - Control Side	7.7	15.5	8.5	10.57	73.8%	652	605.66	564.76	601.20	590.54	6.9%	22.44
25	4	2019	Apr-19	Sweeper-Test Side	13.8	15.7	17.1	15.53	9.0%	1417	1245.17	1224.72	1210.08	1226.65	2.9%	17.62
24	6	2019	Jun-19	Sweeper-Test Side	5.9	24.6	7.4	12.63	148.0%	192	181.30	154.09	178.77	171.39	15.9%	15.03
28	8	2019	Aug-19	Sweeper-Test Side	10	12.4	7.2	9.87	52.7%	160	145.45	142.35	149.25	145.69	4.7%	3.46
29	10	2019	Oct-19	Sweeper-Test Side	4.1	4	4.2	4.10	4.9%	296	284.34	284.62	284.07	284.34	0.2%	0.27
29	10	2019	Oct-19	Sweeper - Control Side	17.6	23.4	17.4	19.47	30.8%	2031	1727.04	1645.87	1729.98	1700.96	4.9%	47.74

Sump Sock %RPD

			Cool: Torra	Day Coole + Cooline out	Dry Sock +	
Collection Date	CB #	Side	Sock Tare	Dry Sock + Sediment	Sediment	%RPD
			Weight (g)	Weight 1 (g)	Weight 2 (g)	
	1	Test	276	350	350	0%
	2	Test	270	450	450	0%
6/19/2018	2	Test	270	450	400	40%
	3	Test	282	600	400	40%
	4	Test	280	450	450	0%
	5	Control	280	600	600	0%
6/10/2018	6	Control	282	400	400	0%
0/15/2018	7	Control	280	500	500	0%
	8	Control	NO SOCK	NA	NA	NA
	1	Test	274	291 76	291 76	0%
	2	Test	2/4	206.86	206.99	0%
8/22/2018	2		280	290.80	290.88	0%
	3	Test	278	294.34	293.98	0%
	4	Test	282	295.35	295.04	0%
	5	Control	270	287.88	287.85	0%
0/22/2010	6	Control	270	286.22	286.19	0%
0/22/2010	7	Control	272	295.27	295	0%
	8	Control	NO SOCK	NA	NA	NA
	1	Test	280	320	310	3%
	2	Test	280	310	410	200/
10/24/2018	2	Test	264	510	410	20%
	3	lest	280	410	360	13%
	4	Test	282	410	360	13%
	5	Control	280	280	310	10%
10/24/2010	6	Control	282	310	310	0%
10/24/2018	7	Control	280	320	360	12%
	8	Control		ΝA	ΝΔ	ΝΔ
	0	Control	206		114	114
	1	Control	290			
4/25/2019	2	Control	284			
	3	Control	278			
	4	Control	288			
	5	Test	278			
	6	Test	288			
4/25/2019	7	Test	276			
	8	Test		ΝA	ΝA	NA
	0	Cantural	272	201.0	201.0	
	1	Control	272	301.8	301.8	0%
6/24/2019	2	Control	270	500	500	0%
-, ,	3	Control	268	381.9	381.9	0%
	4	Control	274	384.6	384.6	0%
	5	Test	272	340.96	340.96	0%
	6	Test	274	287	287	0%
6/24/2019	7	Test	272	400	400	0%
	,	Test		+00	400	070
	8		NU SUCK	NA	NA 000	INA 00/
	1	Control	276	800	800	0%
8/27/2019	2	Control	278	400	400	0%
0/2//2015	3	Control	272	650	650	0%
	4	Control	276	650	650	0%
	5	Test	182	650	650	0%
	6	Test	276	800	800	0%
8/27/2019	7	Test	176	800	800	0%
	,	Tect		NA	N A	N/0
	0	Test	NU SUCK	NA	INA 202	INA 00/
	1	Control	1/8	303	303	0%
10/29/2019	2	Control	178	269	269	0%
10, 25, 2015	3	Control	178	276	276	0%
	4	Control	174	209	209	0%
	5	Test	184	379	379	0%
	6	Test	180	357	357	0%
10/29/2019	7	Tect	174	277	277	0%
	,		1/4	522	322	U%
	8	rest	NU SUCK	NA	INA .	NA
	1	Control	172	331.3	331.3	0%
4/23/2020	2	Control	178	406.37	406.37	0%
7, 23, 2020	3	Control	178	650	650	0%
	4	Control	182	350.91	350.91	0%
	5	Test	180	419.15	419.15	0%
	6	Tort	120	272 72	372.72	0%
4/23/2020	7	Test	100	372.73	372.73	0%
	1		182	370.90	570.96	0%
	8	i lest	I NO SOCK	NA NA	I NA I	NA

Organic Content %RPD

												Organic C	ontent											
			CB Te	st (N)					CB Cont	rol (S)					Sweep T	est (N)					Sweep T	est (S)		
Sample Date	Sample #1	Sample #2	Sample #3	%RPD 1-2	%RPD 2-3	%RPD 1-3	Sample #1	Sample #2	Sample #3	%RPD 1-2	%RPD 2-3	%RPD 1-3	Sample #1	Sample #2	Sample #3	%RPD 1-2	%RPD 2-3	%RPD 1-3	Sample #1	Sample #2	Sample #3	%RPD 1-2 %	RPD 2-3	%RPD 1-3
4/20/2018	15.3						43.8							-							-		· · ·	
8/22/2018	30.7	17.4	39.7	55%	78%	26%	19.6	16.9	37.7	15%	76%	63%	5.8	6.2	5.6	7%	10%	4%						
4/25/2019	13.5						10.3																	
8/28/2019	5.8	9.7	4.6	50%	71%	23%	13.4	10.8	11.9	21%	10%	12%												
10/29/2019	15.2	25.7	20.2	51%	24%	28%	22.9	33.7	20.6	38%	48%	11%	5.7	8.2	5	36%	48%	13%	3.1	2.9	4.3	7%	39%	32%

												Moisture (Content											
			CB Te	st (N)					CB Contr	ol (S)					Sweep Te	est (N)					Sweep Co	ntrol (N)		
Sample Date	Sample #1	Sample #2	Sample #3	%RPD 1-2	%RPD 2-3	%RPD 1-3	Sample #1	Sample #2	Sample #3	%RPD 1-2	%RPD 2-3	%RPD 1-3	Sample #1	Sample #2	Sample #3	%RPD 1-2	%RPD 2-3	%RPD 1-3	Sample #1	Sample #2	Sample #3	%RPD 1-2	%RPD 2-3	%RPD 1-3
4/20/2018	27.8																							
8/23/2018	56.8	45.4	61	22%	29%	7%	42.6	41.7	62.4	2%	40%	38%	16.2	15.3	15.8	6%	3%	2%						
4/25/2019	40						34.2																	
8/28/2019	43.5	32.6	36.1	29%	10%	19%	7.9	17.3	6	75%	97%	27%												
10/30/2019	54.1	63.6	50.2	16%	24%	7%	42.5	56.7	47.5	29%	18%	11%	4.1	4	4.2	2%	5%	2%	17.6	23.4	17.4	28%	29%	1%

Appendix P Statistical Analysis Results





Street Sediment Normality Test Results for Test Side Year 1 (left) and Test Side Year 2 (Right)



Catch Basin Sediment Normality Test Results for Test Side (left) and Control Side (Right)



Catch Basin Sock Sediment Normality Test Results for Test Side (left) and Control Side (Right)

STATISTICAL SIGNIFICANCE TEST RESULTS

Hypothesis 1: Street Sediment Accumulation Rate

	Year 1	Year 2	
Month	Sweeper Test	Sweeper Control	
	(grams/lineal mile/day)	(grams/lineal mile/day)	
April	4389.17	4155.86	
June	1533.53	1761.70	
August	1227.07	1389.28	
October	1060.99	2798.66	

Street Sediment Accumulation Rate Raw Data

SINCE LAST SWEEP NORM RATES

Two-Sample T-Test and CI: Sweeper Test Y1, Sweeper Test Y2

Method

 μ_1 : population mean of Sweeper Test Y1 μ_2 : population mean of Sweeper Test Y2 Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis.

Descriptive Statistics

Sample	Ν	Mean	StDev	SE Mean
Sweeper Test Y1	4	2053	1570	785
Sweeper Test Y2	4	2527	1239	620

Estimation for Difference

95% CI for Difference -474 (-3044, 2097)

Test

Null hypothesis $H_0: \mu_1 - \mu_2 = 0$ Alternative hypothesis $H_1: \mu_1 - \mu_2 \neq 0$

T-Value DF P-Value

-0.47 5 0.656

SINCE LAST SWEEP NORM RATES Mann-Whitney: Sweeper Test Y1, Sweeper Test Y2

Method

 η_1 : median of Sweeper Test Y1 η_2 : median of Sweeper Test Y2 Difference: $\eta_1 - \eta_2$

Descriptive Statistics

Sweeper Test Y1 4 1380.5 Sweeper Test Y2 4 2280.5

Estimation for Difference

	CI for	Achieved
Difference	Difference	Confidence
-431.5	(-3095, 3000)	96.96%

Test

 $\begin{array}{ll} \mbox{Null hypothesis} & H_0: \ \eta_1 \ \cdot \ \eta_2 = 0 \\ \mbox{Alternative hypothesis} & H_1: \ \eta_1 \ \cdot \ \eta_2 \neq 0 \end{array}$

W-Value P-Value

15.00 0.470

Year	Month	Catch Basin Test (grams/catch basin/day)	Catch Basin Control (grams/catch basin/day)
2018	April	22.11	15.75
2018	June	12.91	14.58
2018	August	8.09	12.25
2018	October	23.61	13.02
2019	April	11.39	7.87
2019	June	22.03	8.46
2019	August	15.63	11.14
2019	October	12.04	10.50

Catch Basin Sediment Accumulation Rate Raw Data

SINCE LAST SWEEP NORM RATES

Two-Sample T-Test and CI: Catch Basin Test, Catch Basin Control

Method

 μ_1 : population mean of Catch Basin Test μ_2 : population mean of Catch Basin Control Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis.

Descriptive Statistics

Sample	Ν	Mean	StDev	SE Mean
Catch Basin Test	8	15.98	5.86	2.1
Catch Basin Control	8	11.70	2.77	0.98

Estimation for Difference

95% CI for Difference Difference 4.28 (-0.91, 9.47)

Test

Null hypothesis $H_0: \mu_1 - \mu_2 = 0$ Alternative hypothesis $H_1: \mu_1 - \mu_2 \neq 0$

T-Value DF P-Value 1.87 9 0.095

Year	Month	Catch Basin Sock Test (grams/sump sock/day)	Catch Basin Sock Control (grams/sump sock/day)
2018	April		
2018	June	0.634	0.989
2018	August	0.066	0.521
2018	October	0.331	0.397
2019	April	0.324	0.386
2019	June	0.318	0.139
2019	August	2.329	0.289
2019	October	0.757	0.061

Catch Basin Sock Sediment Accumulation Rate Raw Data



SINCE LAST SWEEP NORM RATES

Two-Sample T-Test and CI: Sump Test, Sump Control

Method

μ: population mean of Sump Test μ: population mean of Sump Control Difference: μ: - μ2

Equal variances are not assumed for this analysis.

Estimation for Difference

 95% Cl for

 Difference
 Difference

 0.008 (-0.335, 0.350)

Test

T-Value DF P-Value

0.05 10 0.961

Appendix Q TAG TER Comments & Responses to Comments

Comment #	Commenter Initials	Section	Page	Comment	Suggested Revision to TER	OCI Response to Comment
1	BCM/WW	2	3	In paragraph 2, second sentence, use of the verb 'was' seems like the wrong tense.	Suggest changing to 'were'.	Updated to 'were'.
2	CP/CSV	2	3	2nd para, 6th sentence. Different description then comment 2	correct grammar and also it appears to repeat. The second description appears correct.	Description of study has been updated in Section 2.0 to be consistent.
3	BCM/WW	3.1	4	In paragraph 1, sentence describing catchbasins with the words catchbasins in parenthsis.	Should the term sump be used in stead of catchbasin?	Wording has been updated to 'sump'.
4	DW/WR	Fig 3.2	7	Reference in Figure title to left and right does not seem to apply to the figure.	Suggest omitting reference altogether or replacing with color code (brown/green)	Replaced with color code.
	KD	3.2		did this option continue in 2019? Try to reference both permits each time - either as having the same requirements or not		Table 3.1 was added that compares the relevant NPDES MS4 requirements between EWA and WWA for the 2019-2024 permit.
5	CP/CSV	3.4	8	1st para, 5th sentence. Different description then comment 1		Description of study has been updated in Section 2.0 to be consistent.
6	CP/CSV	3.4	8	2nd para, 1st sentence. Restate, sentence does not read clearly		Updated text.
7	CP/CSV	3.4	9	1st para, 4th sentence. Organic content was determined only for the catch basin sediment?	clarifly where testing was conducted	Clarified text.
8	DCH	3.4	8	Last paragraph "transferred from the catch basins was be collected and measured."	Delete "be"	Deleted "be".
9	DCH	3.4	9	Bullet 1 " <i>Characterize the sediment collected</i> from each sample location " How do you characterize the sediment, weight, PSD, % of total, etc.?		Revised text as follows: <i>Characterize the</i> sediment collected (particle size distribution and organic content) Also updated in Secton 7.1 for consistency.
10	DCH	4.3	15	"The city owns one street sweeper, an Elgin Crosswind J street sweeper, and two vactor trucks, VacCon Combination Truck." In earlier text you said two sweepers and one vactor truck.	Confirm number of sweepers and vactors	There are two vactor trucks and one sweeper. Earlier text was updated to reflect this.
11	DCH	5.1	17	You might want to note that the test side of the road changed after the first year saying which side was the test side (south or north) in year one and the other side was the test side in year 2.		Added text to the table to clarify.
12	BCM/WW	7.1.2	31	When did the heavy rainstorm event occur? Could this one heavy rain event somehow influenced the organic content in the SS samples by washing them into the CBs? Likewise, could the CB samples have been impacted by having more organic content washed into them?	For discussion by the group and consideration if this event could have affected the sampling data. consider adding more about the heavy event and when it occurred. Add references in this section for when items are further discussed in a subsequent section.	Added text to report.
13	BCM/WW	7.1.2	31	In paragraph 3, fourth sentence, omitted the word 'from'.	Suggest inserting the word from after the first word Results.	Updated text.

TAG TER Coments Responses to Comments

Comment #	Commenter Initials	Section	Page	Comment	Suggested Revision to TER	OCI Response to Comment
14	BCM/WW	7.1.2	38	In Paragraph 2, discussion about the accumulation rate of sediment in October being higher than expected, could this be explained by the fact that most hay hauling is done later in the season (Sept. and Oct.)? Hard to make the correlation but maybe worth a mention.	For discussion by the group and consideration if this event could have affected the sampling data. mention that hay hauling season may have influenced accumulation rate. In general add discuss about hay hauling in section 7. "Generally the hay hauling season is month to month".	Discussion about hay hauling was added. However there is insufficient data to draw conclusions about organic content variability as a function of season.
15	BCM/WW	7.1.4	45	In Paragraph 3, first sentence. Wording indicates something ommitted in the sentence.	Author's discretion.	No change was made
16	BCM/WW	7.3.2	50	In Paragraph 1, sentence 5. "except" is used instaed of exception.	Correction	Updated text.
17	BCM/WW	7.3.2	50	Have you considered including Pan Evaporation Rates for Eburg into the discussion? Evaporation rates are high in semi-arid/arid regions. Records indicate that it rained less than it normally does during the test period and the average wind speeds were close to normal? But what about over all evaporation for the period? Would a higher evaporation rate have any influence on the accumulation data?	For discussion by the group and consideration if this event could have affected the sampling data. Include discussion about evaporation rates in semi- arid locations and how this could influence data. Discuss pan evap rates from winter to summer. Add to weather.	The pan evaporation rates were not identified as a variable that would influence sediment accumulation rates and thus not included in the data collection.
18	BCM/WW	7.3.2	52	How were the Sample Collection Event dates chosen? Were these dates affected by rainfall events? If yes, could this have affected the data collection and outcomes?	For discussion by the group and consideration if this event could have affected the sampling data. Explain in the study.	No change was made to this section because there is discussion regarding the influence of rainfall event on the data. Also the data a was normalized based on the number days since the last sample collection event. Section 8 provides an example of how rainfall events can influent the data.
19	BCM/WW	7.3.2	52,53	Figures 7.21 & 7.22 refer to Daily Precipitation. During the winter months, weren't these events snow events due to the time of year? If so, a comment should be added somewhere to clarify that the "precipitation" measured was snowmelt and not rainfall. And what about plowing during the winter months? Was only sand and salt applied or were the roads plowed as well?	For discussion by the group and consideration if this event could have affected the sampling data. Add a discussion about winter practices including that WSDOT provides this. Also clarify that precipitation is both rainfall and rain equavalent of snow fall	The total precipitation includes both rain and snow fall. The following was added to the first paragraph: <i>These precipitation depths include the</i> <i>measured rainfall depths as well as the rainfall</i> <i>equivalent depth of snow fall.</i>
20	BCM/WW	7.4	53	In Paragraph 1, sentence 2. "include" should be changed to included.	Correction	Updated to "included"
21	CP/CSV	8	56	last sentence, first paragraph. This statement seems to conflict with the above statement.		Clarification was added to both the first and second paragraph in Section 8

TAG TER Coments Responses to Comments

Comment #	Commenter Initials	Section	Page	Comment	Suggested Revision to TER	OCI Response to Comment
	KD	8		Second paragraph regarding reference to timing street sweeping with rainfall events: how would this be possible? it also would not reflect real- world practices. might it not make more sense to recommend that sweeping could be delayed for a certain amount of time following an intense rainfall event?		Provided text that clarifies that the statement about timing street sweeping with rainfall events was intended to provide an example of how difficult it would be to reduce the variability of real world conditions.
	KD	8.1		clarify that sweeping should occur at regular frequencies.		clarified
22	BCM/WW	8.1	57	In the first sentence, the word "were" should be changed to where.	Correction	Updated to "where"
23	DCH	8.1	57	You just say "reference" in the bulk density paragraph of your step-by-step process for developing Figure 7.24. Don't you need to list a reference?	Add specific reference or delete reference	reference added. Also the reference was for 85% not 80% compaction as previously listed so the estimated compaction of catch basin sediment was increased to 65% for developing Figure 7.24
24	CP/CSV	8.2	58	2nd para, 2nd sentence. Does this statement say the opposite of what was stated above?		revisions were made to the paragraph to provided clarification.
25	BCM/WW	8.2	58	In the first sentence, the word "a" appears to be left out between with and reccommended. Also, in second sentence, the word "were" should be changed to where.	Correction	Updated text.
26	BCM/WW	8.2	58	In paragraph 2, sentence 1, the word reported should be used instead of report.	Correction	Updated text.
27	BCM/WW	8.2	59	Should there be some mention about the lack of trees at this test site and how the presence of trees in other locations will have a profound effect on the sediment type and accumulation rates?	For discussion by the group and consideration if this event could have affected the sampling data.	Added text to report.
	KD	8.2		Second Paragraph regarding trasferability of recommendations to different sites: as long as there aren't trees dropping leaf litter?		Additional text was added to the section regarding how the presence of treas may impact the transferability of the recommendations to other sites.
28	DCH	9	60	Text incomplete, still need to provide final conclusions.	Complet text	Section 9 is the conclusion and it was left blank until after the TAG comments/disscusion. It has been completed in the final paper.
29	DCH	5.2.1	18	"November 25, 2018 to March 6, 2019 and from June 17, 2019 to end of study." Where did you get weather data from for March 19 to June 19?		Added text to clarify.