City of Albuquerque

Environmental Health Department

Tim Keller, Mayor

Interoffice Memorandum

May 11, 2020

To: **Regan Eyerman, Senior Environmental Health Scientist**

From: **Jeff Stonesifer, Senior Environmental Health Scientist**
Kyle Tumpane, Environmental Health Scientist

Subject: **Review of model for C&C Services – Updated**

Permit # **3292-M1**

Site Location
2901 2nd St SW & 3015 2nd St SW
Easting: 348845m Northing: 3,879,677m Zone:13

Overview of Facilities
Recycling, crushing and screening of construction demolition materials.

Conclusions of Dispersion Modeling
Modeling was performed for PM_{10}, $PM_{2.5}$, NO_2, CO, and SO_2 using AERMOD. Compliance was demonstrated for NAAQS and NMAAQS.

Assumptions used in the modeling review

1. Operating hours: 7 AM – 7 PM Monday – Saturday
2. Working piles must remain at least 20 feet from the eastern and western fences.
3. The crusher, screen and engine must remain at least 60 feet away from the eastern and western fences and 175 feet away from the southern fence.
4. Crusher and screen restricted to maximum hourly throughput of 300 tons per hour and a maximum annual throughput of 1,123,200 tons per year.
5. Working piles and crusher, screen, engine must remain south of the entrance.
6. Haul truck traffic is limited to 53 trucks per day based on emissions calculations.
7. A fence or some other barrier restricts access to the property.

Modeling conducted in-house demonstrates compliance with applicable regulatory requirements. Modeling files are archived, are part of the public record for this permit application, and are available for printing. No modeling protocol was received.

Modeling Parameters
Rural dispersion coefficients
PVMRM for NO_2 modeling

Emission rates used in the review can be seen below in **Tables 1 & 2**.

Table 1: Particulate Emission Rates for Sources

Source ID	Emission Unit Description	PM10 (lbs/hr)	PM2.5 (lbs/hr)
#14	350 hp diesel engine (Unit #14)	0.012	0.012
#1	Material Drop (Unit #1)	0.033	0.005
#2	Material Drop (Unit #2)	0.033	0.005
#3	Crusher Loading (Unit #3)	0.07	0.01
#4	Screen at Crusher (Unit #4)	0.222	0.015
#5	Crusher (Unit #5)	0.16	0.03
#6	Conveyor at Crusher Drop (Unit #6)	0.014	0.004
#7	Product Pile Formation (Unit #7)	0.033	0.005
#8	Loadout (Unit #8)	0.033	0.005
#9	Product Pile Formation (Unit #9)	0.033	0.005
#10	Loadout (Unit #10)	0.033	0.005
#11	Product Pile Formation (Unit #11)	0.033	0.005
#12	Loadout (Unit #12)	0.033	0.005
#15	Product Pile Formation (Unit #15)	0.033	0.005
#16	Loadout (Unit #16)	0.033	0.005
#17	Product Pile Formation (Unit #17)	0.033	0.005
#18	Loadout (Unit #18)	0.033	0.005
#19	Product Pile Formation (Unit #19)	0.033	0.005
#20	Loadout (Unit #20)	0.033	0.005
#21	Product Pile Formation (Unit #21)	0.033	0.005
#22	Loadout (Unit #22)	0.033	0.005
C&CRHR	Haul Road (Unit #13)	0.91	0.091
	Totals	**1.92**	**0.24**

Table 2: Combustion Gas Emission Rates

Source ID	Source Description	NO_x (lbs/hr)	CO (lbs/hr)	SO_2 (lbs/hr)
C&CENGINE1	350 hp diesel engine (Unit #14)	0.230	2.010	0.720

Receptor Grid

For significant impact level (SIL) modeling, receptor spacing was less than 50 meters along the fence line. Beyond the fence, receptors were spaced 100 meters apart out to 1 kilometer, 250 meters apart out to 2.5 kilometers, 500 meters apart out to 5 kilometers and 1 kilometer apart out to 7 kilometers.

For cumulative NO_2, SO_2 and PM modeling, the receptor grid was reduced based on SIL modeling. Only receptors that met significance levels were kept for the cumulative model. Most of the emissions from C&C and Albuquerque Asphalt are low level, fugitive emissions, which means that the highest impacts will be on or very close to the fence lines.

For the revised cumulative PM_{10} modeling, the receptor grid was reduced based on experience.

Meteorological Data

For the Environmental Health Department (EHD) review, 2014-2018 KABQ (NWS Albuquerque Airport) data was processed with AERMET v.19191 and AERMINUTE v.15272. C&C's consultant used the 2001-2005 KABQ MET data processed with AERMET v.19191, which was the current MET data at the time the consultant ran the models.

Adjacent Sources

For PM modeling:
Albuquerque Asphalt permit #1829-2TR
Bernalillo County Animal Crematory permit #3341

For NO_2 and SO_2 modeling:

Albuquerque Asphalt permit #1829-2TR
Bernalillo County Animal Crematory permit #3341
PNM Rio Bravo Generating Station permit #0694-M2

Terrain Used
USGS NED files

Modeling Results

Table 3: Impact of Emissions vs. Ambient Air Quality Standards

Pollutant	Averaging Time	Modeled Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Model + Background ($\mu g/m^3$)	Most stringent Standard ($\mu g/m^3$)	Pass/Fail
NO_2	1-hour	80.8	84.6	165.4	188	P
NO_2	Annual	0.6	Insignificant modeled impact		94	P
CO	1-hour	214.8			15007	P
CO	8-hour	87.9			9967	P
SO_2	1-hour	65.4	13.1	78.5	196.4	P
PM_{10}	24-hour	59.0 (H2H)	35.0	94.0	150	P
$PM_{2.5}$	24-hour	3.8	20.0	23.8	35	P
$PM_{2.5}$	Annual	1.1	7.8	8.9	12	P

Discussion

There were differences between EHD's modeled impacts and the impacts reported by C&C. The PM modeling that was submitted selected a portion of the sources to run only 12 hours. The sources that were not selected were treated by the model as if they were running 24/7, which resulted in higher PM impacts in the model submitted by C&C's consultant. EHD fixed this so that all C&C sources ran only 7 AM – 7 PM. Some of the difference may also be related to the greater number of receptors in the consultant's cumulative impact analysis model.

The 1-hour NO_2 CIA model run by EHD shows significantly different results than the model submitted by C&C's consultant. Submitted 8th HMD^5years = 178.8 $\mu g/m^3$ while EHD 8th HMD^5years = 192.7 $\mu g/m^3$ in the same location. There is no significant contribution from C&C Services to this exceedance but the difference was investigated to determine why it occurred. After several test runs it was determined that the use of new MET data and ozone data by EHD caused the different result. There is also a minor difference caused by the updated NO_2 background value used by EHD. During testing it was noted that the EHD refined receptor field is slightly different than the refined receptor field used by C&C's consultant. If one runs the modeling exactly as submitted with updated MET and ozone data, additional exceedances may be found but once again the C&C contribution is not significant.

After examining the exceedance in the 1-hour NO_2 model and determining that C&C's contribution was not significant, EHD chose the next highest value from the 8th HMD^5years using the EHD refined receptor field. EHD used different meteorological data (2014-2018 vs. 2001-2005) and updated ozone data compared to C&C's consultant.

EHD also corrected the stack parameters for PNM Rio Bravo Generating Station in the NO_2 and SO_2 cumulative models to match what was presented in the most recent complete application for that facility. These parameters were slightly different than what was provided to C&C's consultant but tests run on the NO_2 cumulative model by EHD showed no change in the modeled impact due to these changes in the PNM stack parameters.

For particulate modeling, only facilities that are very close were included in the cumulative model, whereas for the NO_2 cumulative model, a large facility that is further out was included. The difference is due to the source of the background data. The particulate background comes from the South Valley monitor, whereas the NO_2 background

comes from the Del Norte monitor. The South Valley monitor samples a mixed residential and industrial area. The C&C Services site is also located in a mixed residential and industrial area and is 2 miles from the South Valley monitor. The Del Norte monitor, on the other hand, samples a residential area with offices, shopping and heavy traffic. To properly account for industrial emissions in the NO_2 model for C&C Services, an additional facility was added to the NO_2 model.

Numerous problems were discovered with the first modeling submission. An internal memo dated 24May2019 discussed those problems in detail and an email was sent to C&C's consultant. One of the problems with the first modeling submission was the location of sources. EHD staff visited the C&C Services site on 22May2019 and requested that the model reflect the actual operations at C&C Services.

The lb/hr emission rates for NO_2, SO_2 and CO in the model and modeling report are lower than what is in the current permit #3292. EHD staff called C&C's consultant to inquire about this apparent discrepancy in emission rates. C&C's consultant verified that he calculated lower emission rates than those listed in permit #3292.

Numerous concerns with the second modeling submission were raised in an internal memo dated 14Nov2019. EHD met with C&C Services and its consultant on 27Nov2019 to discuss these concerns, which were addressed in the third modeling submission received on 12Dec2019.

Based on modeling, working piles should remain at least 20 feet from the east and west fences. The crusher, screen and engine need to remain at least 60 feet away from the fence to the east and west, and 175 feet away from the fence to the south. The model has no sources north of the entrance so all equipment and piles must be kept south of the entrance. C&C is restricted to a maximum of 53 haul trucks per day because the pound per hour emission rate for the haul road is based on this number of trucks.

The Technical Analysis Section recommends accepting this model.

Addendum

The particulate emissions were updated by C&C's consultant based on feedback from the EHD permit writer, which resulted in an increase in PM_{10} and $PM_{2.5}$ emissions. It was determined that the $PM_{2.5}$ increase did not warrant further modeling but that the PM_{10} increase did warrant further modeling. C&C's consultant submitted an updated PM_{10} modeling file on 28Apr2020. The SIL model was re-run by EHD with updated emission rates to determine if certain receptors inside Albuquerque Asphalt could be excluded based on significance levels. The receptors could not be excluded based on the increased PM_{10} emission rates from C&C Services. EHD ran the updated PM_{10} model after correcting some issues.

The same issue mentioned in the first paragraph of the discussion regarding C&C sources not having hourly factors also had to be corrected in this revised model. The emission rate of one of the units also had to be corrected to match the updated emission calculations. These corrections made by EHD resulted in different modeled impacts from the modeled impacts reported by C&C's consultant. The modeled exceedance and the other high modeled value inside Albuquerque Asphalt (Figure 3) were investigated to determine if C&C Services was causing either of these modeled results. It was determined that C&C was not causing either high modeled value. The modeled exceedance does not change with or without C&C sources in the model and the other high value only changes a minor amount (Figure 4). Because these receptors are inside Albuquerque Asphalt property, the contribution of Albuquerque Asphalt sources at these receptors cannot be considered. This is because these receptors are not located in ambient air relative to the Albuquerque Asphalt sources. Therefore, EHD selected the highest second high value outside Albuquerque Asphalt's fence line as the result to be compared to the standard (Figure 3). This result shows no exceedance of ambient air quality standards.

The $PM_{2.5}$ 24-hour and annual backgrounds in Table 3 were updated with the most recent values from December 2019 and the associated results were also updated as part of this effort.

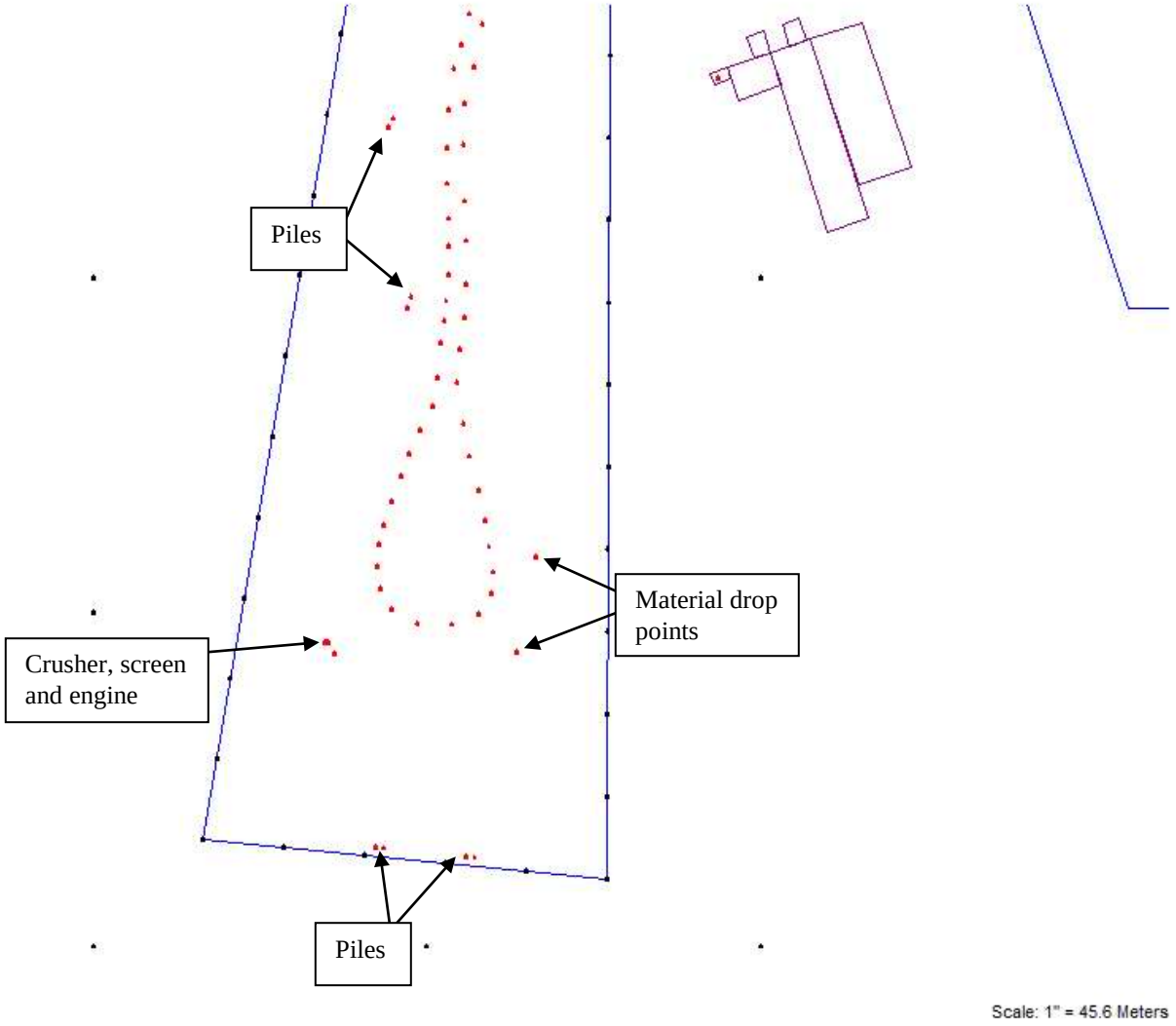

Figure 1. Source layout at the southern end of C&C Services' property.

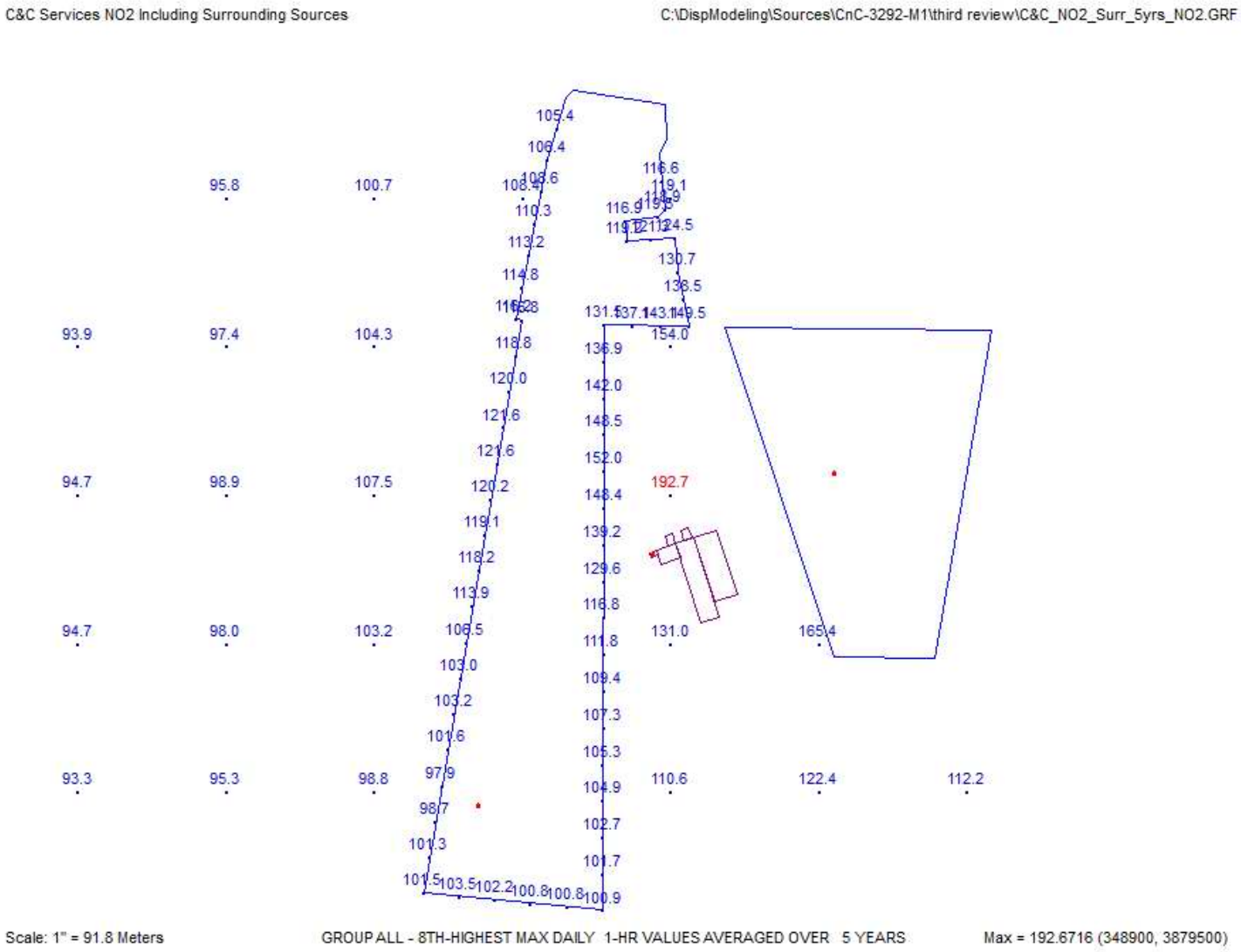

Figure 2. 1-hour NO_2 model results.

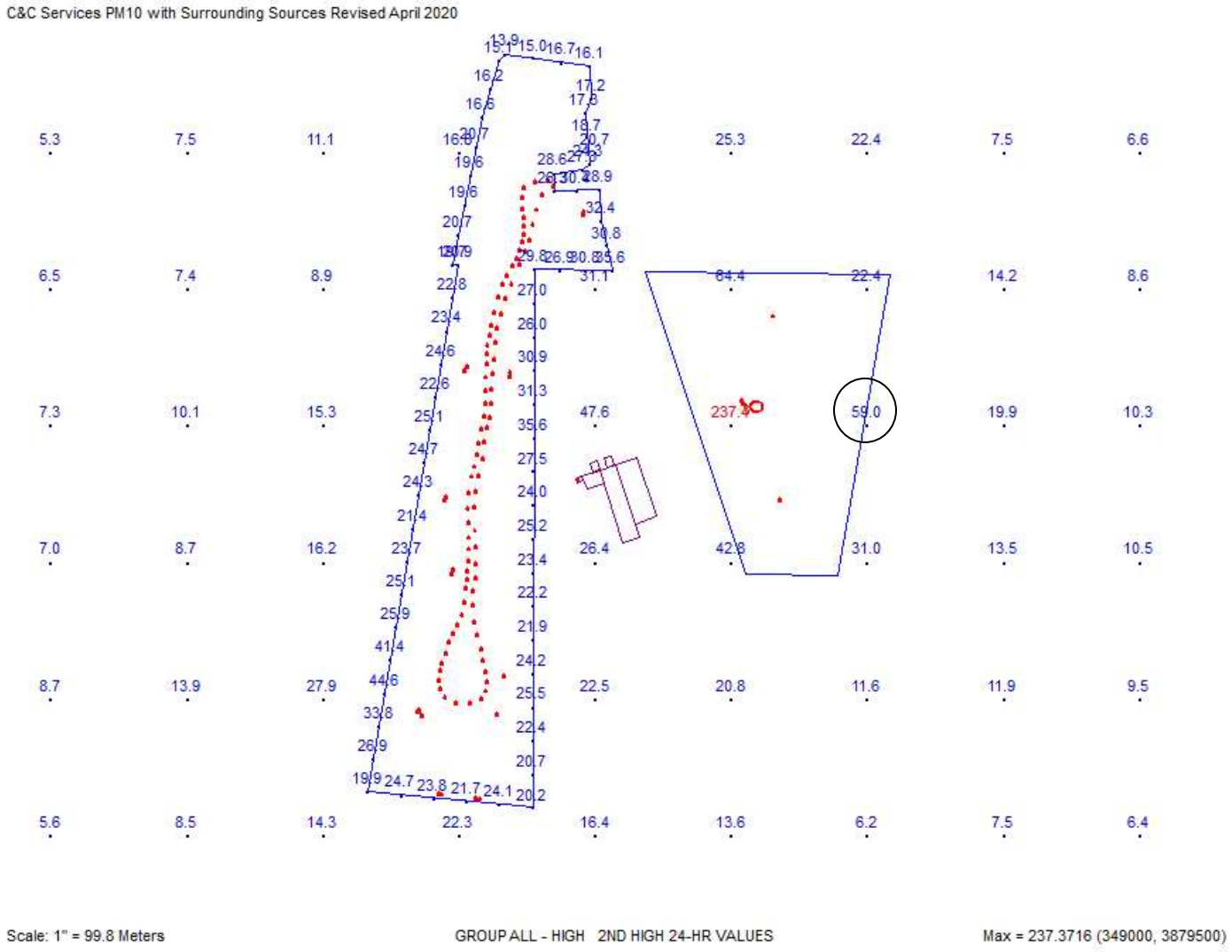

Figure 3. 24-hour PM_{10} model results without background. The high values inside Albuquerque Asphalt are caused by Albuquerque Asphalt. The circled value is the highest modeled impact in ambient air.

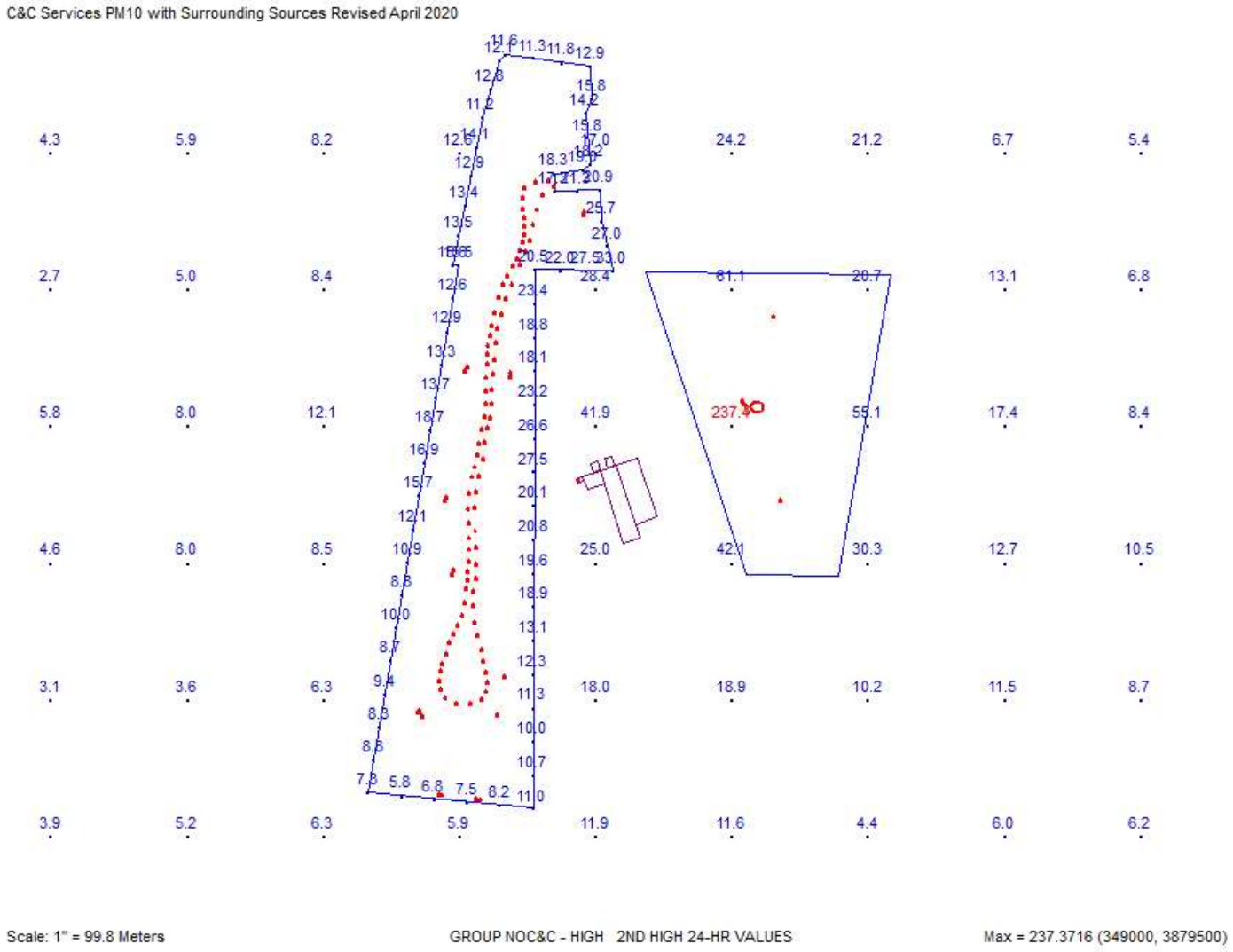

Figure 4. 24-hour PM_{10} model results without background and without C&C sources included. The highest modeled impact does not change and other modeled impacts inside and near Albuquerque Asphalt only decrease slightly.

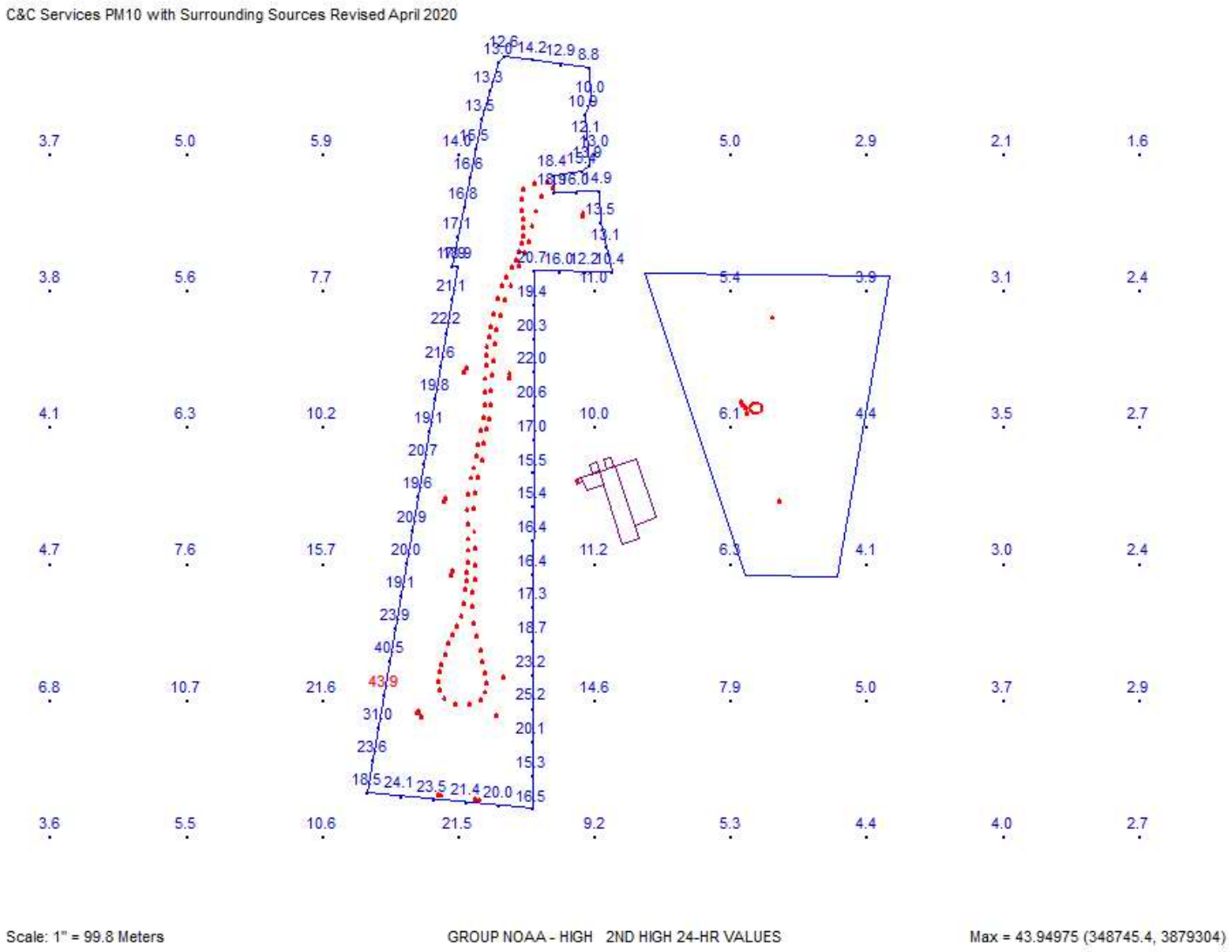

Figure 5. 24-hour PM_{10} model results without background and without Albuquerque Asphalt sources included.