777 12th Street, 3rd Floor SACRAMENTO METROPOLITAN Sacramento, CA 95814

AIR QUALITY
MANAGEMENT DISTRICT

AUTHORITY TO CONSTRUCT EVALUATION

APPLICATION NO.:	A/C 25725
REVIEW STARTING DATE:	08/07/18
ISSUING ENGINEER:	Venk Reddy

I. PROJECT DESCRIPTION:

FACILITY NAME: Sacramento Power Authority

LOCATION: 3215 47th Ave., Sacramento, CA 95824

PROPOSAL: The applicant is requesting to perform two modifications at the facility. The first is an increase in the hourly start-up and quarterly CO emissions of P/O 21738 Gas Turbine and P/O 14071 Duct Burner. Both are controlled by air pollution control devices permitted under P/O 11458 Selective Catalytic Reduction system and P/O 11459 Oxidation Catalyst. This action will trigger BACT for CO which will impose a lower volumetric limit and lower emission rate (lb/hr) at steady state. The second is to perform a "Wet Compression Upgrade" This modification is an equipment addition and replacement which will result in increased efficiency. Both of these changes do not result in an increase in the maximum fuel usage. The Wet Compression Upgrade will result in an increase in MW output and a slight improvement in heat rate. Both modifications are explained in the section below.

INTRODUCTION: Sacramento Power Authority is a combined cycle power plant serving the Sacramento area. The following two changes are proposed.

CO Emission Increase
Sacramento Power Authority is requesting CO emission changes to their operating permit. The changes to the CO emissions do not represent an increase in capacity nor fuel usage but rather changes in monitoring equipment and changes in how the turbine is being dispatched.

The following is a summary of the proposed changes. A tabular summary of emission changes are found at the end of this section.

1) In November 2017, the applicant replaced the CEMS analyzer for CO. This analyzer has a higher span and range than the previous unit. This higher span and range allows the new CO CEMS to more accurately measure the gas turbine's startup emissions. This new CEMS data indicates a brief 15 to 20 minute period of high CO emissions above the previous upper range of the old CO analyzer, resulting in CO mass emissions potentially exceeding the daily emissions limit of the current operating permit. The increase in mass emissions of CO is not the result of a change in operation at the facility, but a higher accuracy in readings of CO emissions from the new CO CEMS during startups.

2) The applicant is proposing higher CO emission limits for all averaging periods that account for more frequent turbine startups based on recent operating practices that integrate renewable energy resources into the SMUD energy mix. Renewable resources tend to be variable, and more frequent turbine starts are necessary to account for this variability in

renewable power supply. This more frequent startups would occur mostly as warm and hot startups with less than 5 days and 24 hours between fuel firing, respectively.

3) Due to the increased CO startup emissions, this application will trigger BACT for CO. As a result the steady state CO emissions will be reduced from the current permitted limits of 4 ppmvd corrected to 15% O2 and 10.81 lb/hr to the new proposed BACT limit of 2 ppmvd corrected to 15% O2 with an hourly mass emission limit of 7.22 lb/hr.

4) To comply with emission monitoring standards less than 200 PPMV, 40 CFR 60 Appendix B performance specification 4A will be added to the CEMs condition on the ATC. This is found in condition 19C of the ATC 25725.

Summary of Emissions Limit Changes

	Lb/hr	lb/day	Q1 lb/qtr	Q2 lb/qtr	Q3 lb/qtr	Q4 lb/qtr
Current CO limit	10.81	326.9	21,265	21,601	22,803	21,708
Proposed CO limit	7.22 (A) 550 (B)	1,258.8	47,600	47,600	47,600	47,600

(A) Steady state operation is the result of BACT implementation.
(B) Start-up emissions hourly limit, proposed by the applicant.

Wet Compression Upgrade

The applicant has also requested to install a “Wet Compression Upgrade” to the turbine. This process will introduce de-mineralized water into the compressor inlet in a controlled and sequenced manner. As the air and water are mixed and compressed, the water evaporates and effectively intercools the front stages of the compressor making the compression process more efficient. By improving the efficiency of the compressor and increasing the mass flow through the turbine, more torque from the turbine is available to drive the generator. The result is a greater amount of available power output in conjunction with an additional benefit of improved heat rate.

This upgrade requires the installation of a high pressure pump skid and new “HR3 Burners” in the turbine combustor. The HR3 Burner design enhances the mixing of fuel gas and combustion air during the gas premix mode. The design also reduces turbulence of the combustion airflow while increasing its velocity through the burner. Together, these features contribute to a more stable combustion. The burner retrofit package includes the HR3 design diagonal swirls and gas injection based packaged in a new HR3 gas distributor with upgraded corrosive resistant gas piping material.

Wet Compression is effective at recovering power loss experienced at high ambient temperatures. Siemens provides a power increase guarantee for the Wet Compression Upgrade Project of 10.5 MW (+-500 kW) at an ambient condition of 105º F and 20% relative humidity, and assumes no evaporative cooler or power augmentation (PAG) water contribution. The applicant hopes to optimize the system performance to achieve an estimated 20 MW increase while operating in “mixed mode,” with both PAG and Wet Compression operating simultaneously at high ambient temperatures. There is no expected increase in fuel usage or emissions as a result of this upgrade.

EQUIPMENT DESCRIPTION:

1. Gas Turbine

Permit No.:	21738 (A/C 25725)
Manufacturer:	Siemens
Model No.:	V84.2
Type:	Combined Cycle
Nominal Rating:	103 MW
Heat Input Rating:	1,410 MMBTU/hour
Fuel:	Natural Gas

2. **Duct Burner**

Permit No.:	14071
Heat Input Rating:	200 MMBTU/hour
Fuel:	Natural Gas

3. Air Pollution Control System – NOx (No change, shown for reference)

Permit No.:	11458
Control Device:	Selective Catalytic Reduction
Manufacturer:	Nooter/Eriksen
Venting:	Gas Turbine (P/O 21738 (A/C 25725) and Duct Burner P/O 14071)

4. **Air Pollution Control System - VOC and CO (No change, shown for reference)**

Permit No.:	11459
Control Device:	Oxidation Catalyst
Manufacturer:	Nooter/Eriksen
Venting:	Gas Turbine (P/O 21738 (A/C 25725) and Duct Burner P/O 14071)

PROCESS RATE/FUEL USAGE:

The turbine and duct burner is limited to a maximum of 1,410 MMBTU/hr and 200 MMBTU/hr respectively. The daily, quarterly and annual process rate and fuel usages are dictated by the emission rates that are limited on the permit. The applicant uses CEMS to monitor emissions to ensure that permitted limits are not exceeded.

OPERATING SCHEDULE: The turbine does not have a restriction on time of day of operation. It can operate at any time provided that the daily, quarterly and yearly emission limits are not exceeded. The duct burner must not operate unless the gas turbine is operating.

CONTROL EQUIPMENT EVALUATION: The turbine and duct burner are controlled by an SCR system permitted under 11458 and an oxidation catalyst permitted under 11459.

II. EMISSIONS CALCULATIONS:

1. HISTORIC POTENTIAL EMISSIONS: The equipment is being evaluated as an existing emission unit (PO 21738); therefore its Historic Potential Emissions are as follows (Rule 202, §225):

Historic Potential Hourly Emissions		
Pollutant		Gas Turbine and Duct Burner (lb/hour)
VOC		9.01
NOx	Normal Steady-State Operation	17.76
	Worst Case Startup	48.00 (A)
SOx		0.97
PM10		7.00
PM2.5		6.99 (B)
CO	Normal Steady-State Operation	10.81
	Worst Case Startup	93.00

(A) NOx hourly emission rate is for reference only, and was used for calculation purposes during the initial evaluation of this turbine. It does not represent a regulatory limit.

(B) This turbine was permitted at a time when PM2.5 was not a regulated pollutant and as such PM2.5 emissions were not specified. In accordance with inventory criteria used for gas turbine combustion, PM2.5 emissions will be based on a 0.998 PM2.5 to PM10 fraction.

Historic Potential Daily Emissions – Including Start-Ups	
Pollutant	Gas Turbine and Duct Burner (lb/day)
VOC	146.7
NOx	384.5
SOx	21.8
PM10	142.1
PM2.5	141.8 (A)
CO	326.9

(A) This turbine was permitted at a time when PM2.5 was not a regulated pollutant and as such PM2.5 emissions were not specified. In accordance with inventory criteria used for gas turbine combustion, PM2.5 emissions will be based on a 0.998 PM2.5 to PM10 fraction.

Pollutant	Historic Potential Quarterly Emissions – Gas Turbine and Duct Burner (A)			
	Quarter 1 lb/quarter	Quarter 2 lb/quarter	Quarter 3 lb/quarter	Quarter 4 lb/quarter
VOC	8,792	8,898	13,264	8,968
NOx	24,209	24,545	26,321	24,725
SOx	1,814	1,836	1,944	1,853
PM10	10,183	9,319	11,444	10,769

Pollutant	Historic Potential Quarterly Emissions – Gas Turbine and Duct Burner (A)			
	Quarter 1 lb/quarter	Quarter 2 lb/quarter	Quarter 3 lb/quarter	Quarter 4 lb/quarter
PM2.5 (B)	10,163	9,301	11,421	10,747
CO	21,265	21,601	22,803	21,708

(A) When the permits were written, the quarterly emissions reflected the emissions from the entire facility not the individual permitted units. However, the emissions in this table reflect the individual potentials to emit for the gas turbine and duct burner as calculated in the original evaluation (EV21738).

(B) This turbine was permitted at a time when PM2.5 was not a regulated pollutant and as such PM2.5 emissions were not specified. In accordance with inventory criteria used for gas turbine combustion, PM2.5 emissions will be based on a 0.998 PM2.5 to PM10 fraction.

Historic Potential Annual Emissions (A)			
Pollutant	Gas Turbine and Duct Burner (TPY)	Cooling Tower (TPY)	Total Facility (TPY)
VOC	19.96	0.09	20.1
NOx	49.90	0.00	49.9
SOx	3.72	0.00	3.7
PM10	20.86	1.69	22.6
PM2.5	20.82	1.69	22.5
CO	43.69	0.00	43.7

(A) The annual emissions for the facility are depicted in P/O 21738. They are calculated from the quarterly emissions from the gas turbine and duct burner added to the emissions from the cooling tower. The facility tons per year has been rounded to one decimal point.

2. PROPOSED POTENTIAL TO EMIT:

The limits are based on the previous permitted values for all pollutants except CO. CO is based on the applicant's request as part of this application. The steady state lb/hr emissions of CO is based on 2 ppmvd corrected to 15% O2 averaged over 1 hr.

Proposed Potential Hourly Emissions		
Pollutant		Gas Turbine and Duct Burner (lb/hour)
VOC		9.01
NOx	Normal Steady-State Operation	17.76
	Worst Case Startup	48.00 (A)
SOx		0.97
PM10		7.00

PM2.5		6.99 (A)
CO	Normal Steady-State Operation	7.22
	Worst Case Startup	550.00

(A) NOx hourly emission rate is for reference only, and was used for calculation purposes during the initial evaluation of this turbine. It does not represent a regulatory limit.

(B) This turbine was permitted at a time when PM2.5 was not a regulated pollutant and as such PM2.5 emissions were not specified. In accordance with inventory criteria used for gas turbine combustion, PM2.5 emissions will be based on a 0.998 PM2.5 to PM10 fraction.

Proposed Potential Daily Emissions Including Start-Ups	
Pollutant	Gas Turbine and Duct Burner (lb/day)
VOC	146.7
NOx	384.5
Sox	21.8
PM10	142.1
PM2.5	141.8 (A)
CO	1,258.8 (B)

(A) This turbine was permitted at a time when PM2.5 was not a regulated pollutant and as such PM2.5 emissions were not specified. In accordance with inventory criteria used for gas turbine combustion, PM2.5 emissions will be based on a 0.998 PM2.5 to PM10 fraction.

(B) CO daily emission rate is based on two startups with 22 hours of normal steady-state operation

Pollutant	Proposed Quarterly Emissions Gas Turbine and Duct Burner (A)			
	Quarter 1 lb/quarter	Quarter 2 lb/quarter	Quarter 3 lb/quarter	Quarter 4 lb/quarter
VOC	8,792	8,898	13,264	8,968
NOx	24,209	24,545	26,321	24,725
SOx	1,814	1,836	1,944	1,853
PM10	10,183	9,319	11,444	10,769
PM2.5 (B)	10,163	9,301	11,421	10,747
CO (C)	47,599	47,599	47,599	47,599

(A) When the permits were written, the quarterly emissions reflected the entire facility emissions not the individual permitted units. However, the emissions in this table reflect the individual potentials to emit for the gas turbine and duct burner as calculated in the previous evaluation (EV21738).

(B) This turbine was permitted at a time when PM2.5 was not a regulated pollutant and as such PM2.5 emissions were not specified. In accordance with inventory criteria used for gas turbine combustion, PM2.5 emissions will be based on a 0.998 PM2.5 to PM10

fraction.

(C) CO quarterly emissions are based on 90 one-hour startups averaging 500 lb/hr CO and 360 hours of normal steady-state operation.

Proposed Potential Annual Emissions (A)			
Pollutant	Gas Turbine and Duct Burner (TPY)	Cooling Tower (TPY)	Total Facility (TPY)
VOC	19.96	0.09	20.1
NOx	49.90	0.00	49.9
SOx	3.72	0.00	3.7
PM10	20.86	1.69	22.6
PM2.5	20.82	1.69	22.5
CO	95.20	0.00	95.2
GHG (B)	726,691	0.00	726,691

(A) The annual emissions for the facility are depicted in P/O 21738. They are calculated from the quarterly emissions from the gas turbine and duct burner added to the emissions from the cooling tower. The facility tons per year has been rounded to one decimal point.

(B) GHG emission is based on back calculating the MMBTU value of the fuel from the SOx emissions. SOx with an emission factor of 0.0006 lb/MMBTU, 1000 BTU/cf. The GHG emission factor used is 117,098 lb/MMCF.

III. COMPLIANCE WITH RULES AND REGULATIONS:

1. **H&S § 42301.6 (AB 3205) COMPLIANCE:** The turbine and duct burner are not located within 1,000 feet from the outer boundary of a school site. Therefore the school public noticing requirements of H&S Code § 42301.6 do not apply.

2. **NSR COMPLIANCE:**

Rule 202 - New Source Review
Since the modification is not considered a major modification for any pollutant (see Appendix A – Major Modification Applicability Determination), the following methodologies will be utilized.

Section 301 - Best Available Control Technology

BACT is triggered for any pollutant for which the emission increase ($BACT_{EI}$) calculated pursuant to Rule 202, Section 411.1 exceeds the levels specified below. For purposes of this calculation, the difference is done using tenths, then the difference is rounded to an integer using standard rounding convention (round up if greater than or equal to 0.5):

BACT is triggered if:

$$BACT_{EI} > BACT_{TL}$$

Where:

$BACT_{EI}$ = Emissions Increase = (DPE – DHPE)
DPE = Daily Potential Emissions (from Section II.2)
DHPE = Daily Historic Potential Emissions (from Section II.1)

$BACT_{TL}$ =

Pollutant	$BACT_{TL}$
VOC	0 lb/day
NOx	0 lb/day
SOx	0 lb/day
CO	550 lb/day
PM_{10}	0 lb/day
$PM_{2.5}$	0 lb/day
Lead	3.3 lb/day

Determination of BACT Applicability for each respective turbine:

Pollutant	DPE (lb/day)	DHPE	$BACT_{EI}$ (lb/day)	$BACT_{TL}$ (lb/day)	Is BACT Required?
VOC	146.7	146.7	0	>0	No
NOx	384.5	384.5	0	>0	No
SOx	21.8	21.8	0	>0	No
PM10	142.1	142.1	0	>0	No
PM2.5	141.8	141.8	0	>0	No
CO	1,258.8	326.9	932	>550	Yes
Lead	0	0	0	>3.3	No

The proposed CO emissions exceed the BACT trigger levels specified in this section and are therefore subject to BACT.

BACT for this project was determined to be the following (See BACT 203 in Appendix B):

BACT (#203) COMBUSTION GAS TURBINE		
Pollutant	**Standard**	**Compliance Demonstration**
VOC	1.0 ppmvd corrected to 15% O2, 3-Hr average, utilizing an Oxidation Catalyst	N/A – BACT was not triggered
NOx	2.0 ppmvd corrected to 15% O2, 1-Hr average	N/A – BACT was not triggered
SOx	Natural Gas or equivalent that meets 0.7 gr Sulfur/100 scf	N/A – BACT was not triggered
PM10	Natural gas or equivalent fuel that meets 0.7 gr Sulfur/100 scf with an air inlet filter cooler and lube oil vent coalescer.	N/A – BACT was not triggered

PM2.5	Natural gas or equivalent fuel that meets 0.7 gr Sulfur/100 scf with an air inlet filter cooler and lube oil vent coalescer.	N/A – BACT was not triggered
CO	2.0 ppmvd corrected to 15% O2, 1-Hr average utilizing an Oxidation Catalyst	The turbine has an oxidation catalyst and the CO emissions will be limited to 2.0 ppmvd corrected to 15% O2, 1-Hr average

The applicant is proposing emission standards and equipment that meet the aforementioned BACT requirements. Therefore, this permit modification complies with BACT.

Section 302 – Offsets: Offsets are triggered for any project where the stationary source potential to emit, calculated pursuant to Rule 202, Section 411.3 exceeds the levels specified below.

Pollutant	lb/qtr
VOC	5,000
NOx	5,000
SOx	13,650
PM10	7,300
PM2.5	15 TPY
CO	49,500

All units at this facility/stationary source were installed after January 1, 1977.

CALCULATION OF OFFSET TRIGGER LEVEL FOR VOC AND NO_X (Qtr 1)

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 11458	SCR	0	0
P/O 11459	Oxidation Catalyst	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808	
P/O 14071	Duct Burner	Emissions combined with A/C 25725	
P/O 14072	Gas Turbine	Modified by P/O 21738	
P/O 21738	Gas Turbine	Modified by A/C 25725	
A/C 24808	Cooling Tower	44	0
A/C 25725	Gas Turbine	8,792	24,209
Total		8,836	24,209
Offset Trigger Level		≥5,000	≥5,000

CALCULATION OF OFFSET TRIGGER LEVEL FOR VOC AND NO_X (Qtr 2)

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 11458	SCR	0	0
P/O 11459	Oxidation Catalyst	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808	
P/O 14071	Duct Burner	Emissions combined with A/C 25725	
P/O 14072	Gas Turbine	Modified by P/O 21738	
P/O 21738	Gas Turbine	Modified by A/C 25725	
A/C 24808	Cooling Tower	45	0
A/C 25725	Gas Turbine	8,898	24,545
Total		8,943	24,545
Offset Trigger Level		≥5,000	≥5,000

CALCULATION OF OFFSET TRIGGER LEVEL FOR VOC AND NO_X (Qtr 3)

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 11458	SCR	0	0
P/O 11459	Oxidation Catalyst	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808	
P/O 14071	Duct Burner	Emissions combined with A/C 25725	
P/O 14072	Gas Turbine	Modified by P/O 21738	
P/O 21738	Gas Turbine	Modified by A/C 25725	
A/C 24808	Cooling Tower	45	0
A/C 25725	Gas Turbine	13,264	26,321
Total		13,309	26,321
Offset Trigger Level		≥5,000	≥5,000

CALCULATION OF OFFSET TRIGGER LEVEL FOR VOC AND NO_X (Qtr 4)

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 11458	SCR	0	0
P/O 11459	Oxidation Catalyst	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808	

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 14071	Duct Burner	Emissions combined with A/C 25725	
P/O 14072	Gas Turbine	Modified by P/O 21738	
P/O 21738	Gas Turbine	Modified by A/C 25725	
A/C 24808	Cooling Tower	45	0
A/C 25725	Gas Turbine	8,968	24,725
Total		9,013	24,725
Offset Trigger Level		≥5,000	≥5,000

Pursuant to Section 411.3 offsets are triggered for VOC and NOx for all four quarters. Pursuant to Section 411.4, the amount of offsets that are required is determined by the potential to emit minus the Historic Actual Emissions. Since this modification is not considered major (see Appendix A - Major Modification Applicability Determination), then Historic Actual Emissions are equal to Historic Potential Emissions. The applicant is not requesting an increase in quarterly emissions from their existing permits, therefore, potential emissions minus Historic Potential Emissions is zero and offsets will not be required.

CALCULATION OF OFFSET TRIGGER LEVEL FOR SO_X, PM_{10}, $PM_{2.5}$, AND CO (Qtr 1)

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 11458	SCR	0	0	0	0
P/O 11459	Oxidation Catalyst	0	0	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808			
P/O 14071	Duct Burner	Emissions combined with A/C 25725			
P/O 14072	Gas Turbine	Modified by P/O 21738			
P/O 21738	Gas Turbine	Modified by A/C 25725			
A/C 24808	Cooling Tower	1.69	0	832	0
A/C 25725	Gas Turbine	20.82	1,814	10,183	47,599
Total		22.51	1,814	11,015	47,599
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

CALCULATION OF OFFSET TRIGGER LEVEL FOR SO_X, PM_{10}, $PM_{2.5}$, AND CO (Qtr 2)

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 11458	SCR	0	0	0	0
P/O 11459	Oxidation Catalyst	0	0	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808			
P/O 14071	Duct Burner	Emissions combined with A/C 25725			
P/O 14072	Gas Turbine	Modified by P/O 21738			
P/O 21738	Gas Turbine	Modified by A/C 25725			
A/C 24808	Cooling Tower	1.69	0	841	0
A/C 25725	Gas Turbine	20.82	1,836	9,319	47,599
Total		22.51	1,836	10,160	47,599
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

CALCULATION OF OFFSET TRIGGER LEVEL FOR SO_X, PM_{10}, $PM_{2.5}$, AND CO (Qtr 3)

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 11458	SCR	0	0	0	0
P/O 11459	Oxidation Catalyst	0	0	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808			
P/O 14071	Duct Burner	Emissions combined with A/C 25725			
P/O 14072	Gas Turbine	Modified by P/O 21738			
P/O 21738	Gas Turbine	Modified by A/C 25725			
A/C 24808	Cooling Tower	1.69	0	850	0
A/C 25725	Gas Turbine	20.82	1,944	11,444	47,599
Total		22.51	1,944	12,294	47,599
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

CALCULATION OF OFFSET TRIGGER LEVEL FOR SO_X, PM_{10}, $PM_{2.5}$, AND CO (Qtr 4)

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 11458	SCR	0	0	0	0
P/O 11459	Oxidation Catalyst	0	0	0	0

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 13316	Cooling Tower	Modified by A/C 24808			
P/O 14071	Duct Burner	Emissions combined with A/C 25725			
P/O 14072	Gas Turbine	Modified by P/O 21738			
P/O 21738	Gas Turbine	Modified by A/C 25725			
A/C 24808	Cooling Tower	1.69	0	850	0
A/C 25725	Gas Turbine	20.82	1,853	10,769	47,599
Total		22.51	1,853	11,619	47,599
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

Pursuant to Section 411.3 offsets are triggered for PM10 and PM2.5 for all four quarters. Pursuant to Section 411.4, the amount of offsets that are required is determined by the potential to emit minus the Historic Actual Emissions. Since this modification is not considered major (see Appendix A - Major Modification Applicability Determination), then Historic Actual Emissions are equal to Historic Potential Emissions. For PM10 and PM2.5, the applicant is not requesting an increase in quarterly emissions from their existing permits, therefore, potential emissions minus Historic Potential Emissions is zero and offsets will not be required.

Section 306 Ambient Air Quality Standard.

In no case shall emissions from a new or modified stationary source prevent or interfere with the attainment or maintenance of any applicable ambient air quality standard. This application involves an increase in the 1-hour level and 8-hr level. Aermod was used to determine the impact of CO as shown below.

Pollutant	Averaging Period	Maximum Facility Impact (µg/m^3)	SIL (µg/m^3)	State Standard (µg/m^3)	Federal Standard (µg/m^3)
CO	1-hour 8-hour	519 35	2,000 500	23,000 10,000	40,000 10,000

As shown above, the CO emissions does not violate any Ambient Air Quality standard

The model parameters used are as follows. The F-factor of 8710 dscf/MMBTU was used to estimate the cfm and was not corrected to stack temperature. This is considered more conservative.

1 hr Parameters
630 MMBTU/hr
16.5% O2
Stack Flow 434,412 dscf/min

8 hr Parameters
1610 MMBTU/hr
15.0 % O2
Stack Flow 827,917 dscf/min

Section 308 –CEQA

The SPA project underwent review/approval by the CEC as an Application for Certification (AFC) where the CEC process was determined to be CEQA equivalent. Because SPA underwent review/approval by the CEC as an Application for Certification (AFC), and this project will require amendment to this AFC, we expect that CEC staff will determine that this project will require CEC review, and this review will satisfy CEQA. Therefore, the SMAQMD will be required to issue a preliminary Authority to Construct which will act as a preliminary determination of compliance (PDOC) prior to issuing the final Authority to Construct permit for the Project which will act as a final determination of compliance (FDOC).

Section 309 – Denial, Adverse Impact to Visibility of a Class I Area
This section requires the Air Pollution Control Officer to deny an Authority to Construct or a Permit to Operate for a new major stationary source or major modification, if the Air Pollution Control Officer finds, after consideration of comments and an analysis from the Federal Land Manager, that the emissions from the proposed facility or modification would have an adverse impact on visibility of a Class 1 area pursuant to CFR Section 51.307(b).

Since this modification, at an existing major source, is not considered major (see Appendix A), this section does not apply.

Section 401 – Alternative Siting
Except as provided in Section 115, this section requires for major sources or major modifications for which an analysis of alternative sites, sizes, and production processes is required under Section 173(a)(5) of the Clean Air Act, the applicant provide an alternative siting analysis that is functionally equivalent to the requirements of Division 13 of the Public Resources Code. The Authority to Construct shall not be issued unless the Air Pollution Control Officer has concluded, based on the information contained in the alternative siting analysis, that the benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification.

Section 115 states that this section does not apply if the application for Authority to Construct is not a Federal Major Modification. Since this modification is not considered major (see Appendix A), this section does not apply.

Section 404 – Enhanced New Source Review
The applicant has requested enhanced new source review. Therefore, this review will be subject to District Rule 207 Section 305 and Sections 401 through 408.

Section 406 – Submittal of BACT Determinations: This permitting action required a new BACT analysis for this source category. The BACT determination Gas Turbine - No. 203 will be submitted in accordance with the requirements of this section.

Section 413 - Sources Impacting Class 1 Areas
This section requires, for new major sources or major modifications that may affect visibility of a Class 1 area, the applicant to provide the Air Pollution Control Officer with an analysis of

impairment to visibility that would occur as a result of the source or modification and general commercial, residential, industrial, and other growth associated with the project, as required by 40 CFR Section 51.307(b)(2) and 40 CFR Section 51.166.

Since this modification, at an existing major source, is not considered major (see Appendix A), this section does not apply.

Rule 203 – Prevention of Significant Deterioration
A source or modification triggers PSD if:

- Its potential to emit any one pollutant is greater than or equal to 100 tons/year if it is one of the 28 selected industrial categories in 42 U.S.C. Section 7479 (1), or greater than or equal to 250 tons/year for all other categories; or
- It is part of a major stationary source and the project's net emissions increase for any pollutant will be greater than the significance levels listed below:

Pollutant	**Level of Significance (Tons/Yr)**
CO	100
NOx	40
SOx	40
PM	25
PM10	15
PM2.5	10 (PM2.5) or 40 (SO2) or 40(NO)
Ozone	40 of NOx or VOCs
Lead	0.6
Fluorides	3
Sulfuric acid mist	7
H_2S	10
Total reduced sulfur (including H_2S)	10
Reduced sulfur compounds (including H_2S)	10
Greenhouse Gases (CO2e)	75,000

There are no emissions sources at the facility that appear to have the potential to emit over 100 or 250 tons per year. In addition the facility emissions would not exceed this threshold either. Since this is not a major stationary source (for PSD purposes), a PSD analysis is not required.

RULE 207 – Title V Federal Operating Permit Program

SPA has a Title V permit. Per Rule 214, Section 101.1, SPA has requested that this application be reviewed through the Enhanced New Source Review process. Consequently, the review of this application is subject to Rule 207, Section 305 and Sections 401 through 408. The Enhanced New Source Review process will allow the District to administratively amend the facility's Title V permit to reflect these changes at a later date.

Section 305 – Title V Permit Content

All the requirements and standards specified in this section are incorporated in the existing Title V Permit and as applicable will be included in this application.

Section 401 through 408 – Administrative Requirements

This permit action will be processed using SMAQMD Rule 214 Section 404 Enhanced New Source Review. The procedural requirements in SMAQMD Rule 207 Sections 401 through 408 will be used. A public notice will be published in the Sacramento Bee requesting comments within a 30 day review period. The U.S. EPA Region 9 will have a 45 day review period.

The use of the Enhanced New Source Review process will allow this permit action to be incorporated into the facility's Title V permit through a Title V administrative permit amendment (see SMAQMD Rule 207 Section 202.5).

Prior to initial construction under this A/C, the applicant must submit a Title V application for an administrative amendment, and the following permit conditions will be listed on the A/C as follows:

S3. This Authority to Construct has been reviewed through an Enhanced New Source Review process in accordance with the procedural requirements of Section 401 through 408 of Rule 207 Title V – Federal Operating Permit Program.

S4. The Sacramento Power Authority must submit to the Air Pollution Control Officer an application to modify the Title V permit with an Administrative Title V Permit Amendment prior to commencing construction with modifications authorized by this Authority to Construct.

Rule 208 – Acid Rain
SPA Cogen operates under a valid Title IV Acid Rain Permit that is part of the existing Title V Permit 2007-12-12. SPA Cogen Clean Air Market Division (CAMD) Account number is 007552FACILITY and currently holds 11 tons of SO2 Allocations in its account. This is sufficient to cover the average deduction amount of 2 tons per year for the project for an additional 5-operating years.

SPA operates SMAQMD approved Continuous Emission Monitoring System (CEMS) and Continuous Parameter Monitoring System (CPMS) use to monitor and record information needed to demonstrate compliance with the Title IV and Title V permits. To date, SPA Cogen has not had an exceedance in emissions, failed to hold sufficient allocations, or failed to surrender allocations in a timely manner. Continued compliance is expected.

Rule 214 – Federal New Source Review
This rule applies to either new major stationary sources, or modifications to existing major stationary sources.

Section 301 - Best Available Control Technology
Since the modification is not considered a major modification for any pollutant (see Appendix A – Major Modification Applicability Determination), the following methodologies will be utilized.

BACT is triggered for any pollutant for which the emission increase ($BACT_{EI}$) calculated pursuant to Rule 202, Section 411.1 exceeds the levels specified below. For purposes of this calculation, the difference is done using tenths, then the difference is rounded to an integer using standard rounding convention (round up if greater than or equal to 0.5):

BACT is triggered if:

$BACT_{EI} > BACT_{TL}$

Where:

$BACT_{EI}$ = Emissions Increase = (DPE – DHPE)
DPE = Daily Potential Emissions (from Section II.2)
DHPE = Daily Historic Potential Emissions (from Section II.1)

$BACT_{TL}$ =

Pollutant	$BACT_{TL}$
VOC	0 lb/day
NOx	0 lb/day
SOx	0 lb/day
CO	550 lb/day
PM_{10}	0 lb/day
$PM_{2.5}$	0 lb/day
Lead	3.3 lb/day

Determination of BACT Applicability for each respective turbine:

Pollutant	DPE (lb/day)	DHPE	$BACT_{EI}$ (lb/day)	$BACT_{TL}$ (lb/day)	Is BACT Required?
VOC	146.7	146.7	0	>0	No
NOx	384.5	384.5	0	>0	No
SOx	21.8	21.8	0	>0	No
PM10	142.1	142.1	0	>0	No
PM2.5	141.8	141.8	0	>0	No
CO	1,258.8	326.9	932	>550	Yes
Lead	0	0	0	>3.3	No

The proposed CO emissions exceed the BACT trigger levels specified in this section and are therefore subject to BACT.

BACT for this project was determined to be the following (See BACT 203 in Appendix B):

BACT (#203) COMBUSTION GAS TURBINE		
Pollutant	**Standard**	**Compliance Demonstration**
VOC	1.0 ppmvd corrected to 15% O2, 3-Hr average, utilizing an Oxidation Catalyst	N/A – BACT was not triggered
NOx	2.0 ppmvd corrected to 15% O2, 1-Hr average	N/A – BACT was not triggered
SOx	Natural Gas or equivalent that meets 0.7 gr Sulfur/100 scf	N/A – BACT was not triggered

PM10	Natural gas or equivalent fuel that meets 0.7 gr Sulfur/100 scf with an air inlet filter cooler and lube oil vent coalescer.	N/A – BACT was not triggered
PM2.5	Natural gas or equivalent fuel that meets 0.7 gr Sulfur/100 scf with an air inlet filter cooler and lube oil vent coalescer.	N/A – BACT was not triggered
CO	2.0 ppmvd corrected to 15% O2, 1-Hr average utilizing an Oxidation Catalyst	The turbine has an oxidation catalyst and the CO emissions will be limited to 2.0 ppmvd corrected to 15% O2, 1-Hr average

The applicant is proposing emission standards and equipment that meet the aforementioned BACT requirements. Therefore, this permit modification complies with BACT.

Section 302 – Offsets: Offsets are triggered for any project where the stationary source potential to emit, calculated pursuant to Rule 202, Section 411.3 exceeds the levels specified below.

Pollutant	lb/qtr
VOC	5,000
NOx	5,000
SOx	13,650
PM10	7,300
PM2.5	15 TPY
CO	49,500

All units at this facility/stationary source were installed after January 1, 1977.

CALCULATION OF OFFSET TRIGGER LEVEL FOR VOC AND NO_x (Qtr 1)

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 11458	SCR	0	0
P/O 11459	Oxidation Catalyst	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808	
P/O 14071	Duct Burner	Emissions combined with A/C 25725	
P/O 14072	Gas Turbine	Modified by P/O 21738	
P/O 21738	Gas Turbine	Modified by A/C 25725	
A/C 24808	Cooling Tower	44	0
A/C 25725	Gas Turbine	8,792	24,209
Total		8,836	24,209
Offset Trigger Level		≥5,000	≥5,000

CALCULATION OF OFFSET TRIGGER LEVEL FOR VOC AND NO_X (Qtr 2)

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 11458	SCR	0	0
P/O 11459	Oxidation Catalyst	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808	
P/O 14071	Duct Burner	Emissions combined with A/C 25725	
P/O 14072	Gas Turbine	Modified by P/O 21738	
P/O 21738	Gas Turbine	Modified by A/C 25725	
A/C 24808	Cooling Tower	45	0
A/C 25725	Gas Turbine	8,898	24,545
Total		8,943	24,545
Offset Trigger Level		≥5,000	≥5,000

CALCULATION OF OFFSET TRIGGER LEVEL FOR VOC AND NO_X (Qtr 3)

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 11458	SCR	0	0
P/O 11459	Oxidation Catalyst	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808	
P/O 14071	Duct Burner	Emissions combined with A/C 25725	
P/O 14072	Gas Turbine	Modified by P/O 21738	
P/O 21738	Gas Turbine	Modified by A/C 25725	
A/C 24808	Cooling Tower	45	0
A/C 25725	Gas Turbine	13,264	26,321
Total		13,309	26,321
Offset Trigger Level		≥5,000	≥5,000

CALCULATION OF OFFSET TRIGGER LEVEL FOR VOC AND NO_X (Qtr 4)

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 11458	SCR	0	0
P/O 11459	Oxidation Catalyst	0	0

Permit No.	Emissions Unit	Stationary Source Potential to Emit lb/quarter	
		VOC	NOx
P/O 13316	Cooling Tower	Modified by A/C 24808	
P/O 14071	Duct Burner	Emissions combined with A/C 25725	
P/O 14072	Gas Turbine	Modified by P/O 21738	
P/O 21738	Gas Turbine	Modified by A/C 25725	
A/C 24808	Cooling Tower	45	0
A/C 25725	Gas Turbine	8,968	24,725
Total		9,013	24,725
Offset Trigger Level		≥5,000	≥5,000

Pursuant to Section 411.3 offsets are triggered for VOC and NOx for all four quarters. Pursuant to Section 411.4, the amount of offsets that are required is determined by the potential to emit minus the Historic Actual Emissions. Since this modification is not considered major (see Appendix A - Major Modification Applicability Determination), then Historic Actual Emissions are equal to Historic Potential Emissions. The applicant is not requesting an increase in quarterly emissions from their existing permits, therefore, potential emissions minus Historic Potential Emissions is zero and offsets will not be required.

CALCULATION OF OFFSET TRIGGER LEVEL FOR SO_X, PM_{10}, $PM_{2.5}$, AND CO (Qtr 1)

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 11458	SCR	0	0	0	0
P/O 11459	Oxidation Catalyst	0	0	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808			
P/O 14071	Duct Burner	Emissions combined with A/C 25725			
P/O 14072	Gas Turbine	Modified by P/O 21738			
P/O 21738	Gas Turbine	Modified by A/C 25725			
A/C 24808	Cooling Tower	1.69	0	832	0
A/C 25725	Gas Turbine	20.82	1,814	10,183	47,599
Total		22.51	1,814	11,015	47,599
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

CALCULATION OF OFFSET TRIGGER LEVEL FOR SO_X, PM_{10}, $PM_{2.5}$, AND CO (Qtr 2)

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 11458	SCR	0	0	0	0
P/O 11459	Oxidation Catalyst	0	0	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808			
P/O 14071	Duct Burner	Emissions combined with A/C 25725			
P/O 14072	Gas Turbine	Modified by P/O 21738			
P/O 21738	Gas Turbine	Modified by A/C 25725			
A/C 24808	Cooling Tower	1.69	0	841	0
A/C 25725	Gas Turbine	20.82	1,836	9,319	47,599
Total		22.51	1,836	10,160	47,599
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

CALCULATION OF OFFSET TRIGGER LEVEL FOR SO_X, PM_{10}, $PM_{2.5}$, AND CO (Qtr 3)

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 11458	SCR	0	0	0	0
P/O 11459	Oxidation Catalyst	0	0	0	0
P/O 13316	Cooling Tower	Modified by A/C 24808			
P/O 14071	Duct Burner	Emissions combined with A/C 25725			
P/O 14072	Gas Turbine	Modified by P/O 21738			
P/O 21738	Gas Turbine	Modified by A/C 25725			
A/C 24808	Cooling Tower	1.69	0	850	0
A/C 25725	Gas Turbine	20.82	1,944	11,444	47,599
Total		22.51	1,944	12,294	47,599
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

CALCULATION OF OFFSET TRIGGER LEVEL FOR SO_X, PM_{10}, $PM_{2.5}$, AND CO (Qtr 4)

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 11458	SCR	0	0	0	0
P/O 11459	Oxidation Catalyst	0	0	0	0

Permit No.	Emissions Unit	Stationary Source Potential to Emit			
		ton/year	lb/quarter		
		PM2.5	SOx	PM10	CO
P/O 13316	Cooling Tower	Modified by A/C 24808			
P/O 14071	Duct Burner	Emissions combined with A/C 25725			
P/O 14072	Gas Turbine	Modified by P/O 21738			
P/O 21738	Gas Turbine	Modified by A/C 25725			
A/C 24808	Cooling Tower	1.69	0	850	0
A/C 25725	Gas Turbine	20.82	1,853	10,769	47,599
Total		22.51	1,853	11,619	47,599
Offset Trigger Level		≥ 15	≥ 13,650	≥ 7,300	≥ 49,500

Pursuant to Section 411.3 offsets are triggered for PM10 and PM2.5 for all four quarters. Pursuant to Section 411.4, the amount of offsets that are required is determined by the potential to emit minus the Historic Actual Emissions. Since this modification is not considered major (see Appendix A - Major Modification Applicability Determination), then Historic Actual Emissions are equal to Historic Potential Emissions. For PM10 and PM2.5, the applicant is not requesting an increase in quarterly emissions from their existing permits, therefore, potential emissions minus Historic Potential Emissions is zero and offsets will not be required.

Section 306 Ambient Air Quality Standard.

In no case shall emissions from a new or modified stationary source prevent or interfere with the attainment or maintenance of any applicable ambient air quality standard. This application involves an increase in the 1-hour level and 8-hr level. Aermod was used to determine the impact of CO as shown below.

Pollutant	**Averaging Period**	**Maximum Facility Impact (µg/m³)**	**SIL (µg/m³)**	**State Standard (µg/m³)**	**Federal Standard (µg/m³)**
CO	1-hour 8-hour	519 35	2,000 500	23,000 10,000	40,000 10,000

As shown above, the CO emissions does not violate any Ambient Air Quality standard

The model parameters used are as follows. The F-factor of 8710 dscf/MMBTU was used to estimate the cfm and was not corrected to stack temperature. This is considered more conservative.

1 hr Parameters
630 MMBTU/hr
16.5% O2
Stack Flow 434,412 dscf/min

8 hr Parameters
1610 MMBTU/hr

15.0 % O2
Stack Flow 827,917 dscf/min

Section 309 – Denial, Adverse Impact to Visibility of a Class I Area
This section requires the Air Pollution Control Officer to deny an Authority to Construct or a Permit to Operate for a new major stationary source or major modification, if the Air Pollution Control Officer finds, after consideration of comments and an analysis from the Federal Land Manager, that the emissions from the proposed facility or modification would have an adverse impact on visibility of a Class 1 area pursuant to CFR Section 51.307(b).

Since this modification, at an existing major source, is not considered major (see Appendix A), this section does not apply.

Section 401 – Alternative Siting
Except as provided in Section 115, this section requires for major sources or major modifications for which an analysis of alternative sites, sizes, and production processes is required under Section 173(a)(5) of the Clean Air Act, the applicant provide an alternative siting analysis that is functionally equivalent to the requirements of Division 13 of the Public Resources Code. The Authority to Construct shall not be issued unless the Air Pollution Control Officer has concluded, based on the information contained in the alternative siting analysis, that the benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification.

Section 115 states that this section does not apply if the application for Authority to Construct is not a Federal Major Modification. Since this modification is not considered major (see Appendix A), this section does not apply.

Section 404 – Enhanced New Source Review
The applicant has requested enhanced new source review. Therefore, this review will be subject to District Rule 207 Section 305 and Sections 401 through 408.
Section 413 - Sources Impacting Class 1 Areas
This section requires, for new major sources or major modifications that may affect visibility of a Class 1 area, the applicant to provide the Air Pollution Control Officer with an analysis of impairment to visibility that would occur as a result of the source or modification and general commercial, residential, industrial, and other growth associated with the project, as required by 40 CFR Section 51.307(b)(2) and 40 CFR Section 51.166.

Since this modification, at an existing major source, is not considered major (see Appendix A), this section does not apply.

Rule 217 – Public Notice Requirements for Permits

Sections 401-402 – CARB, EPA, and Public Notification: The public noticing requirements of Rule 217 do not apply if:

- Offsets are not required under Rule 202, Section 302.
- A visibility analysis is not required under Rule 214, Section 413.
- The increase in potential to emit for the project, calculated under Section 403 of Rule 217, is below the following limits:

Pollutant	lb/qtr
VOC	5,000
NOx	5,000

SOx	9,200
PM10	7,300
PM2.5	10 TPY
CO	49,500

Analysis:

- As determined in Section III.2, offsets are not required.
- This permit action is not subject to Rule 214, so the visibility analysis required by Section 413 of Rule 214 is inapplicable.
- As shown below, the increase in potential to emit does not exceed the notification exemption thresholds.

Increase in Potential to emit					
Pollutant	Potential to Emit for the Project		Increase in PTE	Notification Threshold	Notification Required?
	Pre-Application	Post-Application			
VOC	8,792 - 13,264 lb/qtr	8,792 - 13,264 lb/qtr	0 lb/qtr	≥ 5,000	No
NOx	24,209 - 26,321 lb/qtr	24,209 - 26,321 lb/qtr	0 lb/qtr	≥ 5,000	No
SOx	1,814 - 1,944 lb/qtr	1,814 - 1,944 lb/qtr	0 lb/qtr	≥ 9,200	No
PM10	9,319 – 11,444 lb/qtr	9,319 – 11,444 lb/qtr	0 lb/qtr	≥ 7,300	No
PM2.5	9,300 – 11,421 lb/qtr	9,300 – 11,421 lb/qtr	0 TPY	≥ 10 TPY	No
CO	21,265 - 22,803 lb/qtr	47,599 lb/qtr	24,796 - 26,334 lb/qtr	≥ 49,500	No

Though this modification is not required to conduct a public notice pursuant to Rule 217, nonetheless, this permit modification will be required to conduct a public notice as part of the Enhanced New Source Review process described in Rule 202, Section 404 and Rule 214, Section 402.

3. PROHIBITORY RULE COMPLIANCE:

Rule 401 - Ringelmann Chart
The permit will include conditions requiring that the turbine and duct burner comply with the Ringelmann No. 1 or 20% opacity standard and in the District's experience, properly maintained turbines and duct burners are able to meet the requirement. The equipment will be inspected prior to the issuance of the permit to operate and on a regular basis thereafter to ensure continuous compliance.

Rule 402 – Nuisance
This rule prohibits the discharge of air contaminants in quantities that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public. The SMAQMD regulates new and modified sources of TACs under this rule by implementing its "Risk Assessment Guidelines for New and Modified Stationary Sources," dated December 2000. These guidelines implement what is commonly known as "Toxics New Source Review."

Under the SMAQMD's toxics policy, modified projects with TAC emission increases are required to perform a screening-level health risk assessment. SPA was evaluated for health risk when it was originally permitted. However, since this evaluation was performed under the previous risk assessment guidelines, a screening HRA utilizing the newer risk calculation methodologies will be performed here. The details of the assessment can be found in Appendix C.

The health risk action levels and results are summarized below.

Health Risk Action Levels and Assessment Summary				
Type of Health Risk	Permitting Thresholds(A)		Project HRA Results(B)	
	T-BACT	Maximum	Residential	Worker
Cancer Risk (Chances per Million)	≥ 1.0	10.0	2.5	1.9E-1
Acute Non-Cancer (Hazard Index)	≥ 1.0	1.0	6.6E-3	1.0E-2
Chronic Non-Cancer (Hazard Index)	≥ 1.0	1.0	3.1E-3	3.7E-3

(A) In certain circumstances, the District may allow a health risk in excess of the levels specified here. For more information, see SMAQMD's guidance document, Health Risk Management Programs for Existing, Modified and New Stationary Sources (2016).
(B) Results have been rounded to two significant figure.

The following pollutants and their amounts were identified:

Pollutant	EF lb/MMBTU (A)	lb/yr (C)	lb/hr (D)	Cancer	Acute	Chronic
Ammonia	N/A (B)	192,334.88	21.956		X	X
Acetaldehyde	4.55E-5	5.64E+02	6.44E-02	X	X	X
Acrolein	6.40E-6	9.03E+01	1.03E-02		X	X
Benzene	1.2E-5	1.69E+02	1.93E-02	X	X	X
1,3-Butadiene	4.3E-7	6.06E+00	6.92E-04	X	X	X
Ethyl Benzene	3.2E-5	4.51E+02	5.15E-02	X		X
Formaldehyde	7.1E-4	1.00E+04	1.14E+00	X	X	X
Napthalene	1.3E-6	1.83E+01	2.09E-03	X		X
PAH W/O	2.2E-6	3.10E+01	3.54E-03			X
Propylene Oxide	2.9E-5	4.09E+02	4.67E-02	X	X	X
Toluene	1.3E-4	1.83E+03	2.09E-01		X	X
Xylenes	6.4E-5	9.03E+02	1.03E-01		X	X

(A) From AP-42 Table 3.1-3, 4/00 unless noted
(B) Based on 10 ppm corrected to 15% O2 ammonia slip from SCR system, 100% load, 1610 MMBTU/hr.
(C) Based on hourly emission rate at 8760 hrs/year
(D) Based on the BTU rating of the turbine and duct burner which is totaled to 1,610 MMBTU/hr

The following factors, formulas, and assumptions were taken into consideration in order to estimate the worst case excess cancer risk and the non-cancer health risks for the toxic pollutants emitted.

The project's emissions are modeled with the use of an EPA approved air dispersion model to determine the concentrations of toxic pollutants at residential and non-residential receptors surrounding the project. The model used for this analysis is Lakes Environmental's AERMOD View, Version 9.4.0. The following parameters were used as inputs to the model for each turbine:

Release Height:	48.78 meters
Gas Exit Temperature:	240 °F
Stack Diameter:	17 feet
Gas Exit Flow Rate:	827,917.49 acfm
Nominal Emission Rate:	1.0 g/s

SMAQMD utilizes the California Air Resources Board's Hotspots Analysis and Reporting Program (HARP2), Version 18159 model which incorporates the health risk assessment methodologies from the "Risk Assessment Guidelines - Guidance Manual for Preparation of Health Risk Assessments" (February 2015).

CANCER RISK ASSESSMENT:

From equation 5.4.1.1 and 8.2.4 A:

Riskair = Cair * (BR/BW) * A * EF * CPF * ED/AT * (1E-06) * (GLC) * ASF * FAH

Where:

Riskair	= Cancer risk from inhalation exposure
Cair	= Concentration ($\mu g/m^3$)
(BR/BW)	= Breathing Rate/Body Weight
	= 361 (l/kg-day) 95%, 3rd Trimester
	= 1090 (l/kg-day) 95%, 0<2 yrs
	= 631 (l/kg-day) 80%, 2<9 yrs
	= 572 (l/kg-day) 80%, 2<16 yrs
	= 261 (l/kg-day) 80%, 16<30 yrs
	= 233 (l/kg-day) 80%, 16<70 yrs
	= 230 (l/kg-day) 8 hr worker rate
A	= Inhalation Absorption Factor (default = 1)
EF	= Exposure Frequency
	= 350 days for Res
	= 250 days for Non-Res
CPF	= Cancer Potency Factor (kg-day/mg)
ED	= Exposure Duration, 30 years Res, 25 years Non-Res
AT	= Averaging Time, 25,550 days
ASF	= Age sensitivity factor for a specified age group
FAH	= Fraction of time spent at home (use 1 for children under 16 when a school is within a 1 in a million cancer risk isopleth)
	= 0.85, 3rd Trimester
	= 0.85, 0<2 yrs
	= 0.72, 2<9 yrs
	= 0.72, 2<16 yrs

= 0.73, 16<30 yrs
= 0.73, 16<70 yrs
(1E-06) = (mg/1000 ug)*(m^3/1000 l)
GLC = Ground Level Adjustment Factor
= 1.0 for resident
= 1.0 for worker as this equipment operates up to 24 hours per day.

CANCER RISK SUMMARY:

Permit No.	Receptor (Worst Case)	Excess Cancer Risk (risk in a million)
A/C 25725	Residential (Located at Receptor #736, UTM: 633523.43, 4264104.52)	2.5
	Non-Residential (Located at Receptor #585, UTM: 633342.3, 4263966.02))	1.9E-1

NON-CANCER RISK ASSESSMENT: The chronic non-cancer health risk is determined for a given pollutant by dividing the pollutant's annual average ambient air concentration (ug/m^3) by the chronic reference exposure level of that pollutant in order to obtain the chronic hazard index (HI). The acute non-cancer health risk is determined by dividing the pollutant's maximum hourly ambient air concentration (ug/m^3) by the acute reference exposure level in order to obtain the acute hazard index (HI). In addition, each contaminant can affect different organs of the body and several compounds may affect common organs. Therefore, when there are multiple toxic compounds involved, the effects are additive for the common organs.

A list of chronic or acutely hazardous air contaminants may be found at the OEHHA website www.oehha.ca.gov. The method of calculating the HI numbers (Risk Assessment Guidelines) is also found at this website.

The hazard index for the organs affected are shown below:

Target Organ Affects – Acute HI (Residential)											
Cardiovascular	Central Nervous System	Immune	Kidney	Gilv	Repro/Devel	Respiratory	Skin	Eye	Bone/Teeth	Endo	Blood
X	2.1E-6	1.5E-4	X	X	1.5E-4	2.3E-3	X	6.6E-3	X	X	1.5E-4

Target Organ Affects – Chronic HI (Residential)											
Cardiovascular	Central Nervous System	Immune	Kidney	Gilv	Repro/Devel	Respiratory	Skin	Eye	Bone/Teeth	Endo	Blood
X	9.7E-6	X	2.9E-7	2.9E-7	1.2E-5	3.1E-3	X	1.7E-6	X	2.9E-7	7.4E-5

Target Organ Affects – Acute HI (Non-Residential)											
Cardiovascular	Central Nervous System	Immune	Kidney	Gilv	Repro/Devel	Respiratory	Skin	Eye	Bone/Teeth	Endo	Blood
X	3.4E-6	2.3E-4	X	X	2.4E-4	3.6E-3	X	1.0E-2	X	X	2.3E-4

Target Organ Affects – Chronic HI (Non-Residential)											
Cardiovascular	Central Nervous System	Immune	Kidney	Gilv	Repro/Devel	Respiratory	Skin	Eye	Bone/Teeth	Endo	Blood
X	1.2E-5	X	3.5E-7	3.5E-7	1.5E-5	3.7E-3	X	2.0E-6	X	3.5E-7	8.8E-5

NON-CANCER RISK SUMMARY:

Permit No.	Receptor (Worst Case)	Hazard Index
A/C 25725	Residential - Acute (Located at Receptor #3636, UTM: 633559.98, 4263846.5)	6.6E-3
	Residential - Chronic (Located at Receptor #736, UTM: 633523.43, 4264104.52)	3.1E-3
	Non-Residential - Acute (Located at Receptor #1016, UTM: 633259.55, 4263279.27)	1.0E-2
	Non-Residential – Chronic (Located at Receptor #585, UTM: 633342.3, 4263966.02)	3.7E-3

HRA CONCLUSION: The health risk for this project is considered acceptable to the SMAQMD because:

- The evaluated cancer risk for a maximum exposed individual resident (MEIR) is 2.5 in one million, which is below the significant risk threshold. This reflects a change in Health Risk Assessment methodology and not a change in operation of the emissions from the facility. Therefore T-BACT will not be imposed.
- The evaluated cancer risk for a maximum exposed individual worker (MEIW) is 1.9E-1 in one million, which is below the significant risk threshold. Since the cancer risk is below 1 in one million, T-BACT is not required.
- The evaluated noncancer Acute Hazard Index is less than one for the maximum exposed individual resident (MEIR) and the maximum exposed individual worker (MEIW).
- The evaluated noncancer Chronic Hazard Index is less than one for the maximum exposed individual resident (MEIR) and the maximum exposed individual worker (MEIW).

Rule 406 - Specific Contaminants
The proposed equipment is not expected to exceed the emissions limit of 0.2% by volume sulfur compound as SO_2 and 0.1 gr/dscf for combustion contaminants calculated to 12% CO_2.

Natural Gas Fuel F-Factor	=	8,710 dscf/MMBtu	
Molar Volume	=	385.3 ft3/mol	
Natural Gas HHV	=	1,000 BTU/lb	
Conversion Factor	=	7,000 gr/lb	
PM10 Emission Factor	=	0.01 lb/MMBTU or 10 lb/MMCF	(worst case Duct Burner Emission Factor)
SO_2 Emission Factor	=	0.0006 lb/MMBTU or 0.6 lb/MMCF	
Natural Gas Fuel Density	=	44,582 lb fuel/MMCF	
Weight % C in Natural Gas	=	76 % or 0.76 lb C/lb fuel	
C to CO2 Conversion Efficiency	=	0.995	

PM10 Concentration (combustion contaminants):

A. Calculate uncorrected grain loading
   = (10 lb/MMCF) x (MMCF/1,000 MMBtu) x (7000 gr/lb) x (MMBtu/8,710 dscf)
   = 0.008036739 gr/dscf

B. Calculate CO_2 emission factor (lb CO_2/MMBtu) assuming 100% C to CO_2 conversion
   = (0.76 lb C/lb fuel) x (mol C/12.01 lb C) x (mol CO_2/mol C) x (44.01 lb CO_2/mol CO_2) x (44,582 lb fuel/MMCF) x (MMCF/1,000 MMBtu)
   = 124.159942 lb CO_2/MMBtu

C. Calculate lb CO_2/MMBtu at 99.5% Conversion
   = 124.159942 lb CO_2/MMBtu × 99.5%
   = 123.539142 lb CO_2/MMBtu

D. Calculate volume % of CO_2 in Exhaust Gas
   = % CO_2
   = mol CO_2/mol exhaust
   = (123.539142 lb CO_2/MMBtu) × (mol CO2/44.01 lb CO2) x (MMBtu/8,710 dscf) x (385.3 dscf/mol exhaust)
   = 0.12417497 mol CO_2/mol exhaust or 12.417497 % CO_2

E. Calculate corrected grain loading
   = (0.008036739 gr/dscf) × (12% CO_2/12.417497 % CO_2)

0.007766531 gr/dscf corrected to 12% CO_2

OR

Simplified Equation

= (10 lb/MMCF) x (7000 gr/lb) x (0.12 mol CO_2/mol exhaust) x (lb fuel/0.76 lb C) x (12.01 lb C/mol C) x (mol C/mol CO_2) x (MMCF/44,582 lb fuel/) / (0.995) x (mol exhaust/385.3 dscf)

= 0.007766531 gr/dscf corrected to 12% CO_2

SO2 Concentration (% SO_2 by volume):

The following calculation is at 0% excess air which represents worst case.

= (0.6 lb SO_2/MMCF) x (MMCF/1,000 MMBtu) x (MMBtu/8,710 dscf) x (mol SO_2/64.06 lb SO_2) x (385.3 dscf/mol exhaust)

= 0.000000414 mol SO_2/mol exhaust or 0.0000414 % SO_2

The rule emission limits for SO_2 and PM are 0.2% SO_2 by volume and 0.1 grains/cf at 12% CO2, respectively. Therefore, the emissions from the turbine comply with Rule 406.

Rule 413 – Stationary Gas Turbines

Rule 413 prohibits NOx emissions in excess of 9 ppmvd corrected to 15% O_2 based on a 15-min average, with exceptions for excursions, from gaseous fuel-fired turbines with a maximum electrical output rating of 10 MW or greater operating 877 hours or more per year. Rule 413 is applicable to the SPA turbine, which has a maximum electrical output rating of 103 MW and operates up to 8760 hours/year. At a permitted NOx concentration of 3 ppmvd corrected to 15% O_2 averaged over three hour, the SPA turbine complies with Rule 413 NOx limit.

Rule 420 - Sulfur Content of Fuels

This rule limits the sulfur content of all gaseous fuels to less than 50 grains per 100 cubic foot, calculated as hydrogen sulfide (H_2S). Pipeline natural gas in Sacramento County has a sulfur content of approximately 0.22 grains per 100 cubic foot. Therefore, the turbine will comply with the requirement of this rule.

4. NSPS COMPLIANCE:

40 CFR 60 Subpart A – General Provisions

All affected sources are subject to the general provisions of NSPS Subpart A unless specifically excluded by the source-specific NSPS. Subpart A requires initial notification and performance testing, recordkeeping, monitoring; provides reference methods; and mandates general control device requirements for all other subparts as applicable. SFA will continue to meet all applicable requirements of the general provisions outlined in 40 CFR 60 Subpart A.

40 CFR Part 60 Subpart GG – NSPS for Stationary Gas Turbines

NSPS GG, *Standards of Performance for Stationary Gas Turbines*, applies to stationary gas turbines with a heat input at peak load equal to or greater than 10.7 gigajoules (10 MMBtu) per hour, based on the lower heating value of the fuel fired. Based on the construction date (pre-February 2005) and the heat input at peak loads, the combustion turbine at SPA is subject to NSPS Subpart GG. The Project is not a “modification” under NSPS because it does not result in an increase in hourly emissions of a regulated NSPS pollutant per 40 CFR 60.14. SPA will continue to comply with all applicable NSPS Subpart GG requirements as outlined in the current Title V permit.

40 CFR Part 60 Subpart TTTT – Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units

NSPS TTTT, *Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units*, applies to electric generating units that commenced construction after January 8, 2014, and/or commenced modification or reconstruction after June 18, 2014. The combustion turbine at SPA was constructed prior to January 8, 2014, and has not undergone any NSPS modification or reconstruction since the original installation. As such, NSPS Subpart TTTT does not apply to the existing unit at SPA.

5. **NESHAP COMPLIANCE:**
NESHAPs under 40 CFR, Part 61: The list of all adopted National Emission Standards for Hazardous Air Pollutants (https://www.law.cornell.edu/cfr/text/40/part-61) were reviewed to determine if the proposed project is subject to one or more of these regulations. There are currently no 40 CFR, Part 61 NESHAPs applicable to this source category.

NESHAPs under 40 CFR, Part 63: Due to the District not being delegated for the Part 63 NESHAPs, all Part 63 NESHAPs are enforced as Air Toxics Control Measures (ATCMs). The list of all adopted National Emission Standards for Hazardous Air Pollutants (https://www.law.cornell.edu/cfr/text/40/part-63) were reviewed to determine if the proposed project is subject to one or more of these regulations. No applicable provisions were identified.

6. **ATCM COMPLIANCE:** The list of all adopted Airborne Toxic Control Measures (http://www.arb.ca.gov/toxics/atcm/atcm.htm) was reviewed to determine if the proposed project is subject to one or more of these regulations. No applicable provisions were identified

RECOMMENDATION: This turbine modification will comply with all applicable District rules and regulations. An authority to construct for the modification of the turbines should be issued to Sacramento Power Authority with the following conditions.

Refer to conditions in Authority to Construct No. 25725

REVIEWED BY: Brian F Krebs **DATE:** 11-14-18

APPROVED BY: _____ **DATE:** _____

APPENDIX A

Major Modification Applicability Determination

In order to determine which calculation methodology to use for the BACT and offset trigger analysis, we must first determine if SPA is a “major stationary source” and then whether the project is a “major modification.” The source is subject to both Rule 202 as well as 214 so the “major stationary source” determination must be determined for both rules.

Rule 202

SPA is a “major stationary source” per Rule 202, Section 228 for NOx per the information presented below.

Pollutant	Major Source Threshold	SPA Permit Limit	Major Source?
VOC	25	20.0	**NO**
NOx	25	49.9	**YES**
SO_2	NA	3.7	**NO**
PM_{10}	100 (or 100 tpy SOx as PM10 precursor)	22.6	**NO**
$PM_{2.5}$	100 (or 100 tpy NOx or SOx as $PM_{2.5}$ precursor) (A)	22.5	**NO**
CO	100	43.7	**NO**

(A) At this time VOC and ammonia have not been determined to be a necessary part of the PM2.5 control strategy in the attainment demonstration nor have they been approved by EPA in the State Implementation Plan. As such they are not considered a PM2.5 precursor for the purposes of major stationary source threshold.

Rule 214

SPA is a "major stationary source" per Rule 214, Section 228 for NOx per the information presented below.

Pollutant	Major Source Threshold	SPA Permit Limit	Major Source?
VOC	25	20.0	**NO**
NOx	25	49.9	**YES**
SO_2	NA	3.7	**NO**
PM_{10}	100 (or 100 tpy SOx as PM10 precursor)	22.6	**NO**
$PM_{2.5}$	100 (or 100 tpy NOx or SOx as $PM_{2.5}$ precursor) (A)	22.5	**NO**
CO	NA	43.7	**NA**

(B) At this time VOC and ammonia have not been determined to be a necessary part of the PM2.5 control strategy in the attainment demonstration nor have they been approved by EPA in the State Implementation Plan. As such they are not considered a PM2.5 precursor for the purposes of major stationary source threshold.

The methodology for determining "major modification" is the same for either Rule 202 or 214. For those pollutants (NOx) for which the source is major, it must be determined whether the project is a "major modification" for these pollutants.

Emission increases are determined by the calculation method in Rule 202 or 214, Section 411.5:

> *The sum of the Potential to Emit for the project minus the Historic Actual Emissions, as defined in Section 224.1, for the project. However, the potential to emit, instead of historic actual emissions, can be used for emissions units if either of the following conditions applies:*
>
> *a. Actual emissions are at least 80% of the potential to emit limit, or*
> *b. The emissions unit was fully offset for any emissions increase during the 5 year period prior to the date that the application is deemed complete.*

Though the facility was fully offset for NOx during the original permitting of the project, this happened well over 5 years ago, thus Section 411.5 (b) is not satisfied.

In determining if the 80% criteria of Section 411.5 (a) is satisfied, we must first determine the appropriate historic actual emissions (baseline).

> *224.1* ***Existing emissions units****: Historic actual emissions for the existing emissions unit averaged over the two year period immediately preceding the date of application for an Authority to Construct.*
>
> *a. If the last two years are unrepresentative of normal source operations as determined by the Air Pollution Control Officer, then any two consecutive years of the last five years that represent normal source operation may be used.*

In order to determine the appropriate two year period that represents normal source operations, the applicant has elected to use the last two years of operation (April 2016 through March 2018).

Once the two-year baseline period was established, then historic actual emissions were determined for each pollutant and displayed in the table below.

Pollutant	SPA Actual Emissions Baseline (tpy)	SPA Potential to Emit Permit Limit (tpy)	Percent of Potential to Emit	Actual at Least 80% of PTE?
NOx	28.7	49.9	**57.5%**	**NO**

Since NOx emissions are less than 80% of the SPA facility PTE, the next step is to compare the "emission increase" calculated by subtracting the historic actual emissions from the future potential (permitted) emissions and compare this difference to the "major modification" emission increase thresholds in Section 227

Pollutant	Major Modification Threshold	Proposed Permit Limit	Historical Actual Emissions	Emission Increase	Major Modification?
NOx	25	49.9	28.7	21.2	**NO**

For NOx, the emissions increase when comparing proposed potential to actual emissions results in only a 21.2 TPY increase and thus will not be considered a major modification for this pollutant.

Based on this analysis, the proposed modification is not considered a major modification for any pollutant and as such the calculation methodology used for determining BACT and/or Offset triggers will be Proposed Potential minus Historic Potential (current permitted potential).

Average Data

Plant: SPA Cogen III
Interval: 1 Month
Report Period: 11/01/2012 00:00 Through
Time Online Criteria: 1 minute(s)

Source		UNIT1			
Parameter		NOXLBS60 (lb)		NOx 2 year avg	NOx 2 year avg
				lbs	tons
02/01/13	00:00	4,255.38			
03/01/13	00:00	3,655.59			
04/01/13	00:00	7,340.97			
05/01/13	00:00	1,009.67			
06/01/13	00:00	3,167.74			
07/01/13	00:00	6,539.57			
08/01/13	00:00	7,002.41			
09/01/13	00:00	6,315.40			
10/01/13	00:00	4,446.88			
11/01/13	00:00	7,501.62			
12/01/13	00:00	8,064.34			
01/01/14	00:00	0.00			
02/01/14	00:00	0.00			
03/01/14	00:00	0.00			
04/01/14	00:00	148.93			
05/01/14	00:00	587.60			
06/01/14	00:00	2,011.59			
07/01/14	00:00	5,519.94			
08/01/14	00:00	7,275.37			
09/01/14	00:00	6,509.19			
10/01/14	00:00	5,328.30			
11/01/14	00:00	6,711.98			
12/01/14	00:00	6,865.76			
01/01/15	00:00	7,338.64		53,797	26.9
02/01/15	00:00	4,277.09		53,808	26.9
03/01/15	00:00	3,776.35		53,869	26.9
04/01/15	00:00	6,844.50		53,620	26.8
05/01/15	00:00	6,821.01		56,526	28.3
06/01/15	00:00	6,738.30		58,311	29.2
07/01/15	00:00	6,771.46		58,427	29.2
08/01/15	00:00	6,824.84		58,339	29.2
09/01/15	00:00	6,742.91		58,552	29.3
10/01/15	00:00	4,290.38		58,474	29.2
11/01/15	00:00	7,154.60		58,301	29.2
12/01/15	00:00	7,543.32		58,040	29.0
01/01/16	00:00	8,061.93		62,071	31.0
02/01/16	00:00	4,239.91		64,191	32.1
03/01/16	00:00	288.72		64,335	32.2
04/01/16	00:00	4,885.95		66,705	33.4
05/01/16	00:00	4,523.61		68,673	34.3
06/01/16	00:00	4,583.02		69,959	35.0
07/01/16	00:00	6,147.16		70,272	35.1
08/01/16	00:00	7,395.89		70,332	35.2
09/01/16	00:00	7,024.59		70,590	35.3
10/01/16	00:00	7,636.12		71,744	35.9
11/01/16	00:00	5,045.80		70,911	35.5
12/01/16	00:00	7,721.94		71,339	35.7
01/01/17	00:00	5,725.45		70,532	35.3
02/01/17	00:00	1,956.91		69,373	34.7
03/01/17	00:00	1,354.88		68,163	34.1
04/01/17	00:00	2,888.01		66,184	33.1
05/01/17	00:00	1,377.97		63,463	31.7
06/01/17	00:00	2,327.15		61,257	30.6
07/01/17	00:00	5,368.07		60,556	30.3
08/01/17	00:00	5,105.35		59,696	29.8
09/01/17	00:00	4,891.92		58,770	29.4
10/01/17	00:00	5,594.53		59,422	29.7
11/01/17	00:00	3,676.62		57,683	28.8
12/01/17	00:00	5,409.20		56,616	28.3
01/01/18	00:00	6,232.60		55,702	27.9
02/01/18	00:00	4,321.58		55,743	27.9
3/1/2018	00:00	3,539.85		57,368	28.7

Appendix B
BACT 203

UNDER PUBLIC REVIEW SMAQMD BACT CLEARINGHOUSE

CATEGORY: **TURBINE**

BACT Size: Minor Source BACT **GAS TURBINE**

BACT Determination Number: 203	**BACT Determination Date:**

Equipment Information

Permit Number: 25800
Equipment Description: GAS TURBINE
Unit Size/Rating/Capacity: Turbine, 2200 mmBTU/hr
Equipment Location: SMUD FINANCING AUTHORITY (COSUMNES POWER PLANT)
14295 CLAY EAST RD
HERALD, CA

BACT Determination Information

ROCs	**Standard:**	1.0 ppmvd @t 15% O2, 3-Hr Avg, Oxidation Catalyst
	Technology Description:	Oxidation Catalyst
	Basis:	Achieved In Practice
NOx	**Standard:**	2.0 ppmvd @ 15% O2, 1-Hr Avg
	Technology Description:	SCR or Equivalent
	Basis:	Achieved In Practice
SOx	**Standard:**	Natural Gas or Equiv. that meets 0.7 gr S/100scf
	Technology Description:	
	Basis:	Achieved In Practice
PM10	**Standard:**	Natural Gas or Equiv. that meets 0.7 gr S/100scf
	Technology Description:	
	Basis:	Achieved In Practice
PM2.5	**Standard:**	Natural Gas or Equiv. that meets 0.7 gr S/100scf
	Technology Description:	
	Basis:	Achieved In Practice
CO	**Standard:**	2.0 ppmvd @t 15% O2, 1-HR avg, Oxidation Catalyst
	Technology Description:	Oxidation Catalyst
	Basis:	Achieved In Practice
LEAD	**Standard:**	
	Technology Description:	
	Basis:	

Comments:

District Contact: Brian Krebs Phone No.: (916) 874 -4856 email: bkrebs@airquality.org

Printed: 11/9/2018

Appendix C - HRA

Non-Residential

REC	GRP	NETID	X	Y	RISK_SUM
585	ALL	UCART2	633342.3	4263966	1.86E-07

SCENARIO	INH_RISK	SOIL_RISK	DERMAL_RI	MMILK_RI	WATER_RI	FISH_RISK	CROP_RISK	BEEF_RISK	DAIRY_RIS	PIG_RISK	CHICKEN_R	EGG_RISK
25YrCance	2.97E-08	8.40E-08	7.28E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

REC	GRP	NETID	X	Y	SCENARIO
1016	ALL	UCART3	633259.6	4263279	NonCancerAcute

CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DE	RESP	SKIN	EYE	BONE/TEE	ENDO	BLOOD	ODOR	GENERAL	MAXHI
0.00E+00	3.36E-06	2.33E-04	0.00E+00	0.00E+00	2.40E-04	3.63E-03	0.00E+00	1.04E-02	0.00E+00	0.00E+00	2.33E-04	0.00E+00	0.00E+00	1.04E-02

REC	GRP	NETID	X	Y	SCENARIO
585	ALL	UCART2	633342.3	4263966	NonCancerChronicDerived_InhSoilDerm

CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DE	RESP	SKIN	EYE	BONE/TEE	ENDO	BLOOD	ODOR	GENERAL	MAXHI
0.00E+00	1.16E-05	0.00E+00	3.53E-07	3.53E-07	1.47E-05	3.70E-03	0.00E+00	2.02E-06	0.00E+00	3.53E-07	8.83E-05	0.00E+00	0.00E+00	3.70E-03

Residential

REC	GRP	NETID	X	Y	RISK_SUM
736	ALL	UCART2	633523.4	4264105	2.54E-06

SCENARIO	INH_RISK	SOIL_RISK	DERMAL_RI	MMILK_RI	WATER_RI	FISH_RISK	CROP_RISK	BEEF_RISK	DAIRY_RIS	PIG_RISK	CHICKEN_R	EGG_RISK
30YrCance	2.95E-07	1.66E-06	1.47E-07	4.41E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

REC	GRP	NETID	X	Y	SCENARIO
3636	ALL		633560	4263847	NonCancerAcute

CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DE	RESP	SKIN	EYE	BONE/TEE	ENDO	BLOOD	ODOR	GENERAL	MAXHI
0.00E+00	2.14E-06	1.48E-04	0.00E+00	0.00E+00	1.53E-04	2.31E-03	0.00E+00	6.60E-03	0.00E+00	0.00E+00	1.48E-04	0.00E+00	0.00E+00	6.60E-03

REC	GRP	NETID	X	Y	SCENARIO
736	ALL	UCART2	633523.4	4264105	NonCancerChronicDerived_InhSoilDermMMilk

CV	CNS	IMMUN	KIDNEY	GILV	REPRO/DE	RESP	SKIN	EYE	BONE/TEE	ENDO	BLOOD	ODOR	GENERAL	MAXHI
0.00E+00	9.67E-06	0.00E+00	2.9E-07	2.95E-07	1.22E-05	3.08E-03	0.00E+00	1.69E-06	0.00E+00	2.95E-07	7.37E-05	0.00E+00	0.00E+00	3.08E-03


Brentwood
MEIW 1.86E-1 in a million Cancer, 3.7E-3 Chr
Soin Es
1.0E-2 Acute
Soungate Industrial Pa
Google Earth
© 2018 Google
N
1000 ft

108883MAXHR.txt
108883PER.txt
1151MAXHR.txt
1151PER.txt
1330207MAXHR.txt
1330207PER.txt
50000MAXHR.txt
50000PER.txt
71432MAXHR.txt
71432PER.txt
75070MAXHR.txt
75070PER.txt
75569MAXHR.txt
75569PER.txt
7664417MAXHR.txt
7664417PER.txt
91203MAXHR.txt
91203PER.txt

POLLUTANT HEALTH INFORMATION
Health Database: C:\HARP2\Tables\HEALTH17320.mdb
Health Table Version: HEALTH18121
Official: True

PolID	PolAbbrev	InhCancer	OralCancer	AcuteREL	InhChronicREL	OralChronicREL	InhChronic8HRREL
106990	1,3-Butadiene	0.6		660	2		9
75070	Acetaldehyde	0.01		470	140		300
107028	Acrolein			2.5	0.35		0.7
71432	Benzene	0.1		27	3		3
100414	Ethyl Benzene	0.0087			2000		
50000	Formaldehyde	0.021		55	9		9
91203	Naphthalene	0.12			9		
1151	PAHs-w/o	3.9	12				
75569	Propylene Oxide	0.013		3100	30		
108883	Toluene			37000	300		
1330207	Xylenes			22000	700		
7664417	NH3			3200	200		

AIR DISPERSION MODELING INFORMATION
Versions used in HARP. All executables were obtained from USEPA's Support Center for Regulatory Atmospheric Modeling website (http://www.epa.gov/scram001/)
AERMOD: 18081
AERMAP: 18081
BPIPPRM: 04274
AERPLOT: 13329

METEOROLOGICAL INFORMATION
Version:
Surface File:

HARP Project Summary Report 11/9/2018 11:37:01 AM

PROJECT INFORMATION
HARP Version: 18159
Project Name: 25725NRHARP
Project Output Directory: L:\SSD FOLDERS\Modeling\25500-25999\25725nr\25725NRHARP
HARP Database: NA

FACILITY INFORMATION
Origin
X (m):0
Y (m):0
Zone:1
No. of Sources:0
No. of Buildings:0

EMISSION INVENTORY
No. of Pollutants:12
No. of Background Pollutants:0

Emissions

ScrID	StkID	ProID	PolID	PolAbbrev	Multi	Annual Ems (lbs/yr)	MaxHr Ems (lbs/hr)	MWAF
stck1	0	0	106990	1,3-Butadiene	1	6.06	0.000692	1
stck1	0	0	75070	Acetaldehyde	1	564	0.0644	1
stck1	0	0	107028	Acrolein	1	90.3	0.0103	1
stck1	0	0	71432	Benzene	1	169	0.0193	1
stck1	0	0	100414	Ethyl Benzene	1	451	0.0515	1
stck1	0	0	50000	Formaldehyde	1	10000	1.14	1
stck1	0	0	91203	Naphthalene	1	18.3	0.00209	1
stck1	0	0	1151	PAHs-w/o	1	31	0.00354	1
stck1	0	0	75569	Propylene Oxide	1	409	0.0467	1
stck1	0	0	108883	Toluene	1	1830	0.209	1
stck1	0	0	1330207	Xylenes	1	903	0.103	1
stck1	0	0	7664417	NH3	1	192334.8832	21.96	1

Background

PolID	PolAbbrev	Conc (ug/m^3)	MWAF

Ground level concentration files (\glc\)

100414MAXHR.txt
100414PER.txt
106990MAXHR.txt
106990PER.txt
107028MAXHR.txt
107028PER.txt

Profile File:
Surface Station:
Upper Station:
On-Site Station:

LIST OF AIR DISPERSION FILES
AERMOD Input File:
AERMOD Output File:
AERMOD Error File:
Plotfile list

LIST OF RISK ASSESSMENT FILES
Health risk analysis files (\hra\)

25725nrharpoutCancerRisk.csv
25725nrharpoutCancerRiskSumByRec.csv
25725nrharpoutGLCList.csv
25725nrharpoutHRAInput.hra
25725nrharpoutNCAcuteRisk.csv
25725nrharpoutNCAcuteRiskSumByRec.csv
25725nrharpoutNCChronicRisk.csv
25725nrharpoutNCChronicRiskSumByRec.csv
25725nrharpoutOutput.txt
25725nrharpoutPathwayRec.csv
25725nrharpoutPolDB.csv
~$725nrharpoutOutput.txt

Spatial averaging files (\sa\)

HARP2 - HRACalc (dated 17023) 10/5/2018 11:55:11 AM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
Pathway receptors loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Worker
Scenario: All
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: 16
Total Exposure Duration: 25

Exposure Duration Bin Distribution
3rd Trimester Bin: 0
0<2 Years Bin: 0
2<9 Years Bin: 0
2<16 Years Bin: 0
16<30 Years Bin: 0
16 to 70 Years Bin: 25

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: False
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: Moderate8HR

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
3rd Trimester to 16 years: OFF
16 years to 70 years: OFF

****
SOIL & DERMAL PATHWAY SETTINGS

```
Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

**********
TIER 2 SETTINGS
Tier2 not used.

**********

Calculating cancer risk
Cancer risk breakdown by pollutant and receptor saved to:
C:\25725nr\25725NRHARP\hra\25725nrharpoutCancerRisk.csv
Cancer risk total by receptor saved to:
C:\25725nr\25725NRHARP\hra\25725nrharpoutCancerRiskSumByRec.csv
Calculating chronic risk
Chronic risk breakdown by pollutant and receptor saved to:
C:\25725nr\25725NRHARP\hra\25725nrharpoutNCChronicRisk.csv
Chronic risk total by receptor saved to:
C:\25725nr\25725NRHARP\hra\25725nrharpoutNCChronicRiskSumByRec.csv
Calculating acute risk
Acute risk breakdown by pollutant and receptor saved to:
C:\25725nr\25725NRHARP\hra\25725nrharpoutNCAcuteRisk.csv
Acute risk total by receptor saved to:
C:\25725nr\25725NRHARP\hra\25725nrharpoutNCAcuteRiskSumByRec.csv
HRA ran successfully
```

```
**
**************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.5.0
** Lakes Environmental Software Inc.
** Date: 11/9/2018
** File: C:\25725nr\25725nrinput2.inp
**
**************************************
**
**
**************************************
** AERMOD Control Pathway
**************************************
**
**
CO STARTING
   TITLEONE c:/SPA
   MODELOPT DFAULT CONC
   AVERTIME 1 PERIOD
   URBANOPT 466488 Sacramento
   POLLUTID SO2
   RUNORNOT RUN
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION STK1          POINT      633087.100  4263610.400         6.400
** DESCRSRC Gas Fired Turbine, worst case 1hr Startup Emissions
** Source Parameters **
   SRCPARAM STK1                1.0    30.480   388.706  18.52945      5.182

** Building Downwash **
   BUILDHGT STK1             22.08    22.08    22.08    22.08    22.08    22.08
   BUILDHGT STK1             22.08    22.08    22.08    22.08    22.08    22.08
   BUILDHGT STK1             22.08    22.08    22.08    22.08    22.08    22.08
   BUILDHGT STK1             22.08    22.08    22.08    22.08    22.08    22.08
   BUILDHGT STK1             22.08    22.08    22.08    22.08    22.08    22.08
   BUILDHGT STK1             22.08    22.08    22.08    22.08    22.08    22.08

   BUILDWID STK1             29.22    29.56    29.00    27.56    25.87    23.72
   BUILDWID STK1             20.84    17.33    13.30    17.33    20.84    23.72
   BUILDWID STK1             25.87    27.68    29.10    29.63    29.26    28.00
   BUILDWID STK1             29.22    29.56    29.00    27.56    25.87    23.72
   BUILDWID STK1             20.84    17.33    13.30    17.33    20.84    23.72
   BUILDWID STK1             25.87    27.68    29.10    29.63    29.26    28.00

   BUILDLEN STK1             17.33    20.84    23.72    25.87    27.68    29.10
   BUILDLEN STK1             29.63    29.26    28.00    29.22    29.56    29.00
   BUILDLEN STK1             27.56    25.87    23.72    20.84    17.33    13.30
   BUILDLEN STK1             17.33    20.84    23.72    25.87    27.68    29.10
```

```
   BUILDLEN STK1              29.63    29.26    28.00    29.22    29.56    29.00
   BUILDLEN STK1              27.56    25.87    23.72    20.84    17.33    13.30

   XBADJ    STK1              -9.63   -13.07   -16.11   -18.66   -20.65   -22.00
   XBADJ    STK1             -22.69   -22.69   -22.00   -22.95   -23.20   -22.75
   XBADJ    STK1             -21.61   -19.81   -17.41   -14.48   -11.11    -7.40
   XBADJ    STK1              -7.70    -7.77    -7.61    -7.21    -7.04    -7.10
   XBADJ    STK1              -6.94    -6.57    -6.00    -6.27    -6.36    -6.25
   XBADJ    STK1              -5.95    -6.06    -6.31    -6.37    -6.23    -5.90

   YBADJ    STK1               8.34     8.42     8.25     7.83     6.87     5.55
   YBADJ    STK1               4.06     2.44     0.75    -0.96    -2.65    -4.25
   YBADJ    STK1              -5.72    -6.80    -7.45    -7.88    -8.06    -8.00
   YBADJ    STK1              -8.34    -8.42    -8.25    -7.83    -6.87    -5.55
   YBADJ    STK1              -4.06    -2.44    -0.75     0.96     2.65     4.25
   YBADJ    STK1               5.72     6.80     7.45     7.88     8.06     8.00

   URBANSRC ALL
   SRCGROUP STK1      STK1
   SRCGROUP ALL
SO FINISHED
**
**********************************
** AERMOD Receptor Pathway
**********************************
**
**
RE STARTING
   GRIDCART UCART1 STA
                XYINC 633132.73 21 25.84 4263578.95 21 11.72
                ELEV    1     6.40     6.40     6.40     6.50     6.60     6.60
                ELEV    1     6.70     6.70     6.70     6.70     6.70     6.70
                ELEV    1     6.70     6.70     6.70     6.70     6.70     6.80
                ELEV    1     7.00     7.00     7.00
                ELEV    2     6.40     6.40     6.40     6.50     6.70     6.70
                ELEV    2     6.70     6.70     6.70     6.70     6.70     6.70
                ELEV    2     6.70     6.70     6.70     6.70     6.80     6.80
                ELEV    2     7.00     7.00     7.00
                ELEV    3     6.40     6.40     6.50     6.60     6.70     6.70
                ELEV    3     6.70     6.70     6.70     6.70     6.70     6.70
                ELEV    3     6.70     6.70     6.70     6.80     6.90     6.90
                ELEV    3     7.00     7.00     7.00
                ELEV    4     6.40     6.40     6.50     6.70     6.70     6.70
                ELEV    4     6.70     6.70     6.70     6.70     6.70     6.70
                ELEV    4     6.70     6.70     6.70     6.90     7.00     7.00
                ELEV    4     7.00     7.00     7.00
                ELEV    5     6.40     6.50     6.60     6.70     6.70     6.70
                ELEV    5     6.70     6.70     6.70     6.70     6.70     6.70
                ELEV    5     6.70     6.70     6.80     6.90     7.00     7.00
                ELEV    5     7.00     7.00     7.00
                ELEV    6     6.40     6.50     6.70     6.70     6.70     6.70
                ELEV    6     6.70     6.70     6.70     6.70     6.70     6.70
                ELEV    6     6.70     6.70     6.90     7.00     7.00     7.00
                ELEV    6     7.00     7.00     7.00
                ELEV    7     6.40     6.50     6.70     6.70     6.70     6.70
                ELEV    7     6.70     6.70     6.70     6.70     6.70     6.70
                ELEV    7     6.70     6.70     6.90     7.00     7.00     7.00
                ELEV    7     7.00     7.00     7.00
```

ELEV	8	6.40	6.50	6.70	6.70	6.70	6.70
ELEV	8	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	8	6.70	6.80	7.00	7.00	7.00	7.00
ELEV	8	7.00	7.00	7.00			
ELEV	9	6.40	6.50	6.70	6.70	6.70	6.70
ELEV	9	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	9	6.70	6.90	7.00	7.00	7.00	7.00
ELEV	9	7.00	7.00	7.00			
ELEV	10	6.50	6.60	6.70	6.70	6.70	6.70
ELEV	10	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	10	6.70	7.00	7.00	7.00	7.00	7.00
ELEV	10	7.00	7.00	7.00			
ELEV	11	6.50	6.70	6.70	6.70	6.70	6.70
ELEV	11	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	11	6.70	7.00	7.00	7.00	7.00	7.00
ELEV	11	7.00	7.00	7.00			
ELEV	12	6.60	6.70	6.70	6.70	6.70	6.70
ELEV	12	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	12	6.70	7.00	7.00	7.00	7.00	7.00
ELEV	12	7.00	7.00	7.00			
ELEV	13	6.60	6.70	6.70	6.70	6.70	6.70
ELEV	13	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	13	6.80	7.00	7.00	7.00	7.00	7.00
ELEV	13	7.00	7.00	7.00			
ELEV	14	6.60	6.70	6.70	6.70	6.70	6.70
ELEV	14	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	14	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	14	7.00	7.00	7.00			
ELEV	15	6.60	6.70	6.70	6.70	6.70	6.70
ELEV	15	6.70	6.70	6.70	6.70	6.70	6.80
ELEV	15	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	15	7.00	7.00	7.00			
ELEV	16	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	16	6.70	6.70	6.70	6.70	6.80	6.90
ELEV	16	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	16	7.00	7.00	7.00			
ELEV	17	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	17	6.70	6.70	6.70	6.70	6.80	7.00
ELEV	17	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	17	7.00	7.00	7.00			
ELEV	18	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	18	6.70	6.70	6.70	6.80	6.90	7.00
ELEV	18	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	18	7.00	7.00	7.00			
ELEV	19	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	19	6.70	6.70	6.70	6.80	7.00	7.00
ELEV	19	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	19	7.00	7.00	7.00			
ELEV	20	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	20	6.70	6.70	6.70	6.90	7.00	7.00
ELEV	20	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	20	7.00	7.00	7.00			
ELEV	21	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	21	6.70	6.70	6.80	6.90	7.00	7.00
ELEV	21	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	21	7.00	7.00	7.00			
HILL	1	6.40	6.40	6.40	6.50	6.60	6.60
HILL	1	6.70	6.70	6.70	6.70	6.70	6.70

HILL	1	6.70	6.70	6.70	6.70	6.70	6.80
HILL	1	7.00	7.00	7.00			
HILL	2	6.40	6.40	6.40	6.50	6.70	6.70
HILL	2	6.70	6.70	6.70	6.70	6.70	6.70
HILL	2	6.70	6.70	6.70	6.70	6.80	6.80
HILL	2	7.00	7.00	7.00			
HILL	3	6.40	6.40	6.50	6.60	6.70	6.70
HILL	3	6.70	6.70	6.70	6.70	6.70	6.70
HILL	3	6.70	6.70	6.70	6.80	6.90	6.90
HILL	3	7.00	7.00	7.00			
HILL	4	6.40	6.40	6.50	6.70	6.70	6.70
HILL	4	6.70	6.70	6.70	6.70	6.70	6.70
HILL	4	6.70	6.70	6.70	6.90	7.00	7.00
HILL	4	7.00	7.00	7.00			
HILL	5	6.40	6.50	6.60	6.70	6.70	6.70
HILL	5	6.70	6.70	6.70	6.70	6.70	6.70
HILL	5	6.70	6.70	6.80	6.90	7.00	7.00
HILL	5	7.00	7.00	7.00			
HILL	6	6.40	6.50	6.70	6.70	6.70	6.70
HILL	6	6.70	6.70	6.70	6.70	6.70	6.70
HILL	6	6.70	6.70	6.90	7.00	7.00	7.00
HILL	6	7.00	7.00	7.00			
HILL	7	6.40	6.50	6.70	6.70	6.70	6.70
HILL	7	6.70	6.70	6.70	6.70	6.70	6.70
HILL	7	6.70	6.70	6.90	7.00	7.00	7.00
HILL	7	7.00	7.00	7.00			
HILL	8	6.40	6.50	6.70	6.70	6.70	6.70
HILL	8	6.70	6.70	6.70	6.70	6.70	6.70
HILL	8	6.70	6.80	7.00	7.00	7.00	7.00
HILL	8	7.00	7.00	7.00			
HILL	9	6.40	6.50	6.70	6.70	6.70	6.70
HILL	9	6.70	6.70	6.70	6.70	6.70	6.70
HILL	9	6.70	6.90	7.00	7.00	7.00	7.00
HILL	9	7.00	7.00	7.00			
HILL	10	6.50	6.60	6.70	6.70	6.70	6.70
HILL	10	6.70	6.70	6.70	6.70	6.70	6.70
HILL	10	6.70	7.00	7.00	7.00	7.00	7.00
HILL	10	7.00	7.00	7.00			
HILL	11	6.50	6.70	6.70	6.70	6.70	6.70
HILL	11	6.70	6.70	6.70	6.70	6.70	6.70
HILL	11	6.70	7.00	7.00	7.00	7.00	7.00
HILL	11	7.00	7.00	7.00			
HILL	12	6.60	6.70	6.70	6.70	6.70	6.70
HILL	12	6.70	6.70	6.70	6.70	6.70	6.70
HILL	12	6.70	7.00	7.00	7.00	7.00	7.00
HILL	12	7.00	7.00	7.00			
HILL	13	6.60	6.70	6.70	6.70	6.70	6.70
HILL	13	6.70	6.70	6.70	6.70	6.70	6.70
HILL	13	6.80	7.00	7.00	7.00	7.00	7.00
HILL	13	7.00	7.00	7.00			
HILL	14	6.60	6.70	6.70	6.70	6.70	6.70
HILL	14	6.70	6.70	6.70	6.70	6.70	6.70
HILL	14	7.00	7.00	7.00	7.00	7.00	7.00
HILL	14	7.00	7.00	7.00			
HILL	15	6.60	6.70	6.70	6.70	6.70	6.70
HILL	15	6.70	6.70	6.70	6.70	6.70	6.80
HILL	15	7.00	7.00	7.00	7.00	7.00	7.00
HILL	15	7.00	7.00	7.00			

```
                HILL    16      6.70    6.70    6.70    6.70    6.70    6.70
                HILL    16      6.70    6.70    6.70    6.70    6.80    6.90
                HILL    16      7.00    7.00    7.00    7.00    7.00    7.00
                HILL    16      7.00    7.00    7.00
                HILL    17      6.70    6.70    6.70    6.70    6.70    6.70
                HILL    17      6.70    6.70    6.70    6.70    6.80    7.00
                HILL    17      7.00    7.00    7.00    7.00    7.00    7.00
                HILL    17      7.00    7.00    7.00
                HILL    18      6.70    6.70    6.70    6.70    6.70    6.70
                HILL    18      6.70    6.70    6.70    6.80    6.90    7.00
                HILL    18      7.00    7.00    7.00    7.00    7.00    7.00
                HILL    18      7.00    7.00    7.00
                HILL    19      6.70    6.70    6.70    6.70    6.70    6.70
                HILL    19      6.70    6.70    6.70    6.80    7.00    7.00
                HILL    19      7.00    7.00    7.00    7.00    7.00    7.00
                HILL    19      7.00    7.00    7.00
                HILL    20      6.70    6.70    6.70    6.70    6.70    6.70
                HILL    20      6.70    6.70    6.70    6.90    7.00    7.00
                HILL    20      7.00    7.00    7.00    7.00    7.00    7.00
                HILL    20      7.00    7.00    7.00
                HILL    21      6.70    6.70    6.70    6.70    6.70    6.70
                HILL    21      6.70    6.70    6.80    6.90    7.00    7.00
                HILL    21      7.00    7.00    7.00    7.00    7.00    7.00
                HILL    21      7.00    7.00    7.00
GRIDCART UCART1 END
GRIDCART UCART2 STA
                XYINC 632869.02 21 27.84 4263821.36 21 24.11
                ELEV    1       6.10    6.50    6.50    6.40    6.40    6.50
                ELEV    1       6.70    6.70    6.70    6.70    6.70    6.70
                ELEV    1       6.70    6.70    6.70    6.70    6.70    6.90
                ELEV    1       7.00    7.00    7.00
                ELEV    2       6.70    6.70    6.60    6.60    6.60    6.70
                ELEV    2       6.70    6.70    6.70    6.70    6.70    6.70
                ELEV    2       6.70    6.70    6.70    6.70    6.80    7.00
                ELEV    2       7.00    7.00    7.00
                ELEV    3       7.30    7.00    6.80    6.70    6.70    6.70
                ELEV    3       6.70    6.70    6.70    6.70    6.70    6.70
                ELEV    3       6.70    6.70    6.80    6.90    7.00    7.00
                ELEV    3       7.00    7.00    7.00
                ELEV    4       7.60    7.20    6.90    6.80    6.70    6.70
                ELEV    4       6.70    6.70    6.70    6.70    6.70    6.70
                ELEV    4       6.80    6.80    7.00    7.00    7.00    7.00
                ELEV    4       7.00    7.00    7.00
                ELEV    5       7.60    7.40    7.10    7.00    6.90    6.70
                ELEV    5       6.70    6.70    6.70    6.70    6.70    6.70
                ELEV    5       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    5       7.00    7.00    7.00
                ELEV    6       7.60    7.40    7.30    7.10    7.00    6.80
                ELEV    6       6.70    6.70    6.70    6.70    6.70    7.00
                ELEV    6       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    6       7.00    7.00    7.00
                ELEV    7       7.60    7.40    7.30    7.10    7.00    7.00
                ELEV    7       6.90    6.90    6.90    6.90    6.90    7.00
                ELEV    7       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    7       7.00    7.00    7.10
                ELEV    8       7.60    7.40    7.30    7.20    7.10    7.00
                ELEV    8       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    8       7.00    7.00    7.00    7.00    7.00    7.00
```

ELEV	8	7.00	7.10	7.20			
ELEV	9	7.60	7.40	7.30	7.30	7.10	7.00
ELEV	9	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	9	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	9	7.00	7.20	7.30			
ELEV	10	7.60	7.40	7.30	7.30	7.20	7.00
ELEV	10	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	10	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	10	7.00	7.20	7.30			
ELEV	11	7.60	7.40	7.30	7.30	7.30	7.20
ELEV	11	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	11	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	11	7.00	7.20	7.30			
ELEV	12	7.40	7.30	7.30	7.30	7.30	7.20
ELEV	12	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	12	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	12	7.10	7.30	7.30			
ELEV	13	7.40	7.30	7.30	7.30	7.30	7.20
ELEV	13	7.20	7.10	7.00	7.00	7.00	7.00
ELEV	13	7.00	7.00	7.00	7.00	7.00	7.00
ELEV	13	7.20	7.30	7.30			
ELEV	14	7.40	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.20	7.10	7.00	7.00	7.00
ELEV	14	7.00	7.00	7.00	7.00	7.00	7.10
ELEV	14	7.20	7.30	7.30			
ELEV	15	7.40	7.30	7.30	7.30	7.30	7.30
ELEV	15	7.30	7.30	7.20	7.10	7.00	7.00
ELEV	15	7.00	7.00	7.00	7.00	7.00	7.20
ELEV	15	7.30	7.30	7.30			
ELEV	16	7.40	7.30	7.30	7.30	7.30	7.30
ELEV	16	7.30	7.30	7.30	7.30	7.30	7.00
ELEV	16	7.00	7.00	7.00	7.00	7.00	7.20
ELEV	16	7.30	7.30	7.30			
ELEV	17	7.40	7.30	7.30	7.30	7.30	7.30
ELEV	17	7.30	7.30	7.30	7.30	7.30	7.20
ELEV	17	7.20	7.00	7.00	7.00	7.20	7.30
ELEV	17	7.30	7.30	7.30			
ELEV	18	7.40	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.20	7.20	7.20	7.30	7.30
ELEV	18	7.30	7.30	7.30			
ELEV	19	7.40	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.30			
ELEV	20	7.40	7.30	7.30	7.30	7.30	7.30
ELEV	20	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	20	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	20	7.30	7.30	7.30			
ELEV	21	7.40	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30			
HILL	1	6.10	6.50	6.50	6.40	6.40	6.50
HILL	1	6.70	6.70	6.70	6.70	6.70	6.70
HILL	1	6.70	6.70	6.70	6.70	6.70	6.90
HILL	1	7.00	7.00	7.00			
HILL	2	6.70	6.70	6.60	6.60	6.60	6.70

HILL	2	6.70	6.70	6.70	6.70	6.70	6.70
HILL	2	6.70	6.70	6.70	6.70	6.80	7.00
HILL	2	7.00	7.00	7.00			
HILL	3	7.30	7.00	6.80	6.70	6.70	6.70
HILL	3	6.70	6.70	6.70	6.70	6.70	6.70
HILL	3	6.70	6.70	6.80	6.90	7.00	7.00
HILL	3	7.00	7.00	7.00			
HILL	4	7.60	7.20	6.90	6.80	6.70	6.70
HILL	4	6.70	6.70	6.70	6.70	6.70	6.70
HILL	4	6.80	6.80	7.00	7.00	7.00	7.00
HILL	4	7.00	7.00	7.00			
HILL	5	7.60	7.40	7.10	7.00	6.90	6.70
HILL	5	6.70	6.70	6.70	6.70	6.70	6.70
HILL	5	7.00	7.00	7.00	7.00	7.00	7.00
HILL	5	7.00	7.00	7.00			
HILL	6	7.60	7.40	7.30	7.10	7.00	6.80
HILL	6	6.70	6.70	6.70	6.70	6.70	7.00
HILL	6	7.00	7.00	7.00	7.00	7.00	7.00
HILL	6	7.00	7.00	7.00			
HILL	7	7.60	7.40	7.30	7.10	7.00	7.00
HILL	7	6.90	6.90	6.90	6.90	6.90	7.00
HILL	7	7.00	7.00	7.00	7.00	7.00	7.00
HILL	7	7.00	7.00	7.10			
HILL	8	7.60	7.40	7.30	7.20	7.10	7.00
HILL	8	7.00	7.00	7.00	7.00	7.00	7.00
HILL	8	7.00	7.00	7.00	7.00	7.00	7.00
HILL	8	7.00	7.10	7.20			
HILL	9	7.60	7.40	7.30	7.30	7.10	7.00
HILL	9	7.00	7.00	7.00	7.00	7.00	7.00
HILL	9	7.00	7.00	7.00	7.00	7.00	7.00
HILL	9	7.00	7.20	7.30			
HILL	10	7.60	7.40	7.30	7.30	7.20	7.00
HILL	10	7.00	7.00	7.00	7.00	7.00	7.00
HILL	10	7.00	7.00	7.00	7.00	7.00	7.00
HILL	10	7.00	7.20	7.30			
HILL	11	7.60	7.40	7.30	7.30	7.30	7.20
HILL	11	7.00	7.00	7.00	7.00	7.00	7.00
HILL	11	7.00	7.00	7.00	7.00	7.00	7.00
HILL	11	7.00	7.20	7.30			
HILL	12	7.40	7.30	7.30	7.30	7.30	7.20
HILL	12	7.00	7.00	7.00	7.00	7.00	7.00
HILL	12	7.00	7.00	7.00	7.00	7.00	7.00
HILL	12	7.10	7.30	7.30			
HILL	13	7.40	7.30	7.30	7.30	7.30	7.20
HILL	13	7.20	7.10	7.00	7.00	7.00	7.00
HILL	13	7.00	7.00	7.00	7.00	7.00	7.00
HILL	13	7.20	7.30	7.30			
HILL	14	7.40	7.30	7.30	7.30	7.30	7.30
HILL	14	7.30	7.20	7.10	7.00	7.00	7.00
HILL	14	7.00	7.00	7.00	7.00	7.00	7.10
HILL	14	7.20	7.30	7.30			
HILL	15	7.40	7.30	7.30	7.30	7.30	7.30
HILL	15	7.30	7.30	7.20	7.10	7.00	7.00
HILL	15	7.00	7.00	7.00	7.00	7.00	7.20
HILL	15	7.30	7.30	7.30			
HILL	16	7.40	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.30	7.30	7.30	7.00
HILL	16	7.00	7.00	7.00	7.00	7.00	7.20

```
                HILL    16      7.30    7.30    7.30
                HILL    17      7.40    7.30    7.30    7.30    7.30    7.30
                HILL    17      7.30    7.30    7.30    7.30    7.30    7.20
                HILL    17      7.20    7.00    7.00    7.00    7.20    7.30
                HILL    17      7.30    7.30    7.30
                HILL    18      7.40    7.30    7.30    7.30    7.30    7.30
                HILL    18      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    18      7.30    7.20    7.20    7.20    7.30    7.30
                HILL    18      7.30    7.30    7.30
                HILL    19      7.40    7.30    7.30    7.30    7.30    7.30
                HILL    19      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    19      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    19      7.30    7.30    7.30
                HILL    20      7.40    7.30    7.30    7.30    7.30    7.30
                HILL    20      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    20      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    20      7.30    7.30    7.30
                HILL    21      7.40    7.30    7.30    7.30    7.30    7.30
                HILL    21      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    21      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    21      7.30    7.30    7.30
GRIDCART UCART2 END
GRIDCART UCART3 STA
                XYINC 632964.92 21 42.09 4263171.39 21 17.98
                ELEV    1       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    1       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    1       6.40    6.40    6.40    6.40    6.60    6.70
                ELEV    1       6.70    6.70    6.70
                ELEV    2       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    2       6.10    6.10    6.10    6.10    6.10    6.20
                ELEV    2       6.40    6.40    6.40    6.40    6.70    6.70
                ELEV    2       6.70    6.70    6.70
                ELEV    3       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    3       6.10    6.10    6.10    6.10    6.10    6.20
                ELEV    3       6.40    6.40    6.40    6.40    6.70    6.70
                ELEV    3       6.70    6.70    6.70
                ELEV    4       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    4       6.10    6.10    6.10    6.10    6.10    6.20
                ELEV    4       6.40    6.40    6.40    6.40    6.70    6.70
                ELEV    4       6.70    6.70    6.70
                ELEV    5       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    5       6.10    6.10    6.10    6.10    6.10    6.30
                ELEV    5       6.40    6.40    6.40    6.60    6.70    6.70
                ELEV    5       6.70    6.70    6.70
                ELEV    6       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    6       6.10    6.10    6.10    6.10    6.20    6.40
                ELEV    6       6.40    6.40    6.40    6.70    6.70    6.70
                ELEV    6       6.70    6.70    6.70
                ELEV    7       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    7       6.10    6.10    6.10    6.10    6.30    6.40
                ELEV    7       6.40    6.40    6.40    6.70    6.70    6.70
                ELEV    7       6.70    6.70    6.70
                ELEV    8       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    8       6.10    6.10    6.10    6.20    6.40    6.40
                ELEV    8       6.40    6.40    6.50    6.70    6.70    6.70
                ELEV    8       6.70    6.80    6.80
                ELEV    9       6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    9       6.10    6.10    6.10    6.30    6.40    6.40
```

ELEV	9	6.40	6.40	6.60	6.70	6.70	6.70
ELEV	9	6.70	6.90	7.00			
ELEV	10	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	10	6.10	6.10	6.10	6.40	6.40	6.40
ELEV	10	6.40	6.50	6.70	6.70	6.70	6.70
ELEV	10	6.80	7.00	7.00			
ELEV	11	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	11	6.10	6.10	6.20	6.40	6.40	6.40
ELEV	11	6.40	6.50	6.70	6.70	6.70	6.70
ELEV	11	6.80	7.00	7.00			
ELEV	12	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	12	6.10	6.10	6.40	6.40	6.40	6.40
ELEV	12	6.40	6.70	6.70	6.70	6.70	6.70
ELEV	12	6.80	7.00	7.00			
ELEV	13	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	13	6.10	6.20	6.40	6.40	6.40	6.40
ELEV	13	6.50	6.70	6.70	6.70	6.70	6.70
ELEV	13	6.80	7.00	7.00			
ELEV	14	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	14	6.10	6.40	6.40	6.40	6.40	6.40
ELEV	14	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	14	6.80	7.00	7.00			
ELEV	15	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	15	6.20	6.40	6.40	6.40	6.40	6.60
ELEV	15	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	15	6.90	7.00	7.00			
ELEV	16	6.10	6.10	6.10	6.10	6.10	6.20
ELEV	16	6.30	6.40	6.40	6.40	6.50	6.70
ELEV	16	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	16	7.00	7.00	7.00			
ELEV	17	6.10	6.10	6.10	6.10	6.10	6.30
ELEV	17	6.40	6.40	6.40	6.40	6.60	6.70
ELEV	17	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	17	7.00	7.00	7.00			
ELEV	18	6.10	6.10	6.10	6.10	6.20	6.40
ELEV	18	6.40	6.40	6.40	6.50	6.70	6.70
ELEV	18	6.70	6.70	6.70	6.70	6.70	6.80
ELEV	18	7.00	7.00	7.00			
ELEV	19	6.10	6.10	6.10	6.10	6.30	6.40
ELEV	19	6.40	6.40	6.40	6.60	6.70	6.70
ELEV	19	6.70	6.70	6.70	6.70	6.70	7.00
ELEV	19	7.00	7.00	7.00			
ELEV	20	6.10	6.10	6.10	6.30	6.40	6.40
ELEV	20	6.40	6.40	6.40	6.70	6.70	6.70
ELEV	20	6.70	6.70	6.70	6.70	6.80	7.00
ELEV	20	7.00	7.00	7.00			
ELEV	21	6.10	6.10	6.10	6.40	6.40	6.40
ELEV	21	6.40	6.40	6.50	6.70	6.70	6.70
ELEV	21	6.70	6.70	6.70	6.70	6.90	7.00
ELEV	21	7.00	7.00	7.00			
HILL	1	6.10	6.10	6.10	6.10	6.10	6.10
HILL	1	6.10	6.10	6.10	6.10	6.10	6.10
HILL	1	6.40	6.40	6.40	6.40	6.60	6.70
HILL	1	6.70	6.70	6.70			
HILL	2	6.10	6.10	6.10	6.10	6.10	6.10
HILL	2	6.10	6.10	6.10	6.10	6.10	6.20
HILL	2	6.40	6.40	6.40	6.40	6.70	6.70
HILL	2	6.70	6.70	6.70			

HILL	3	6.10	6.10	6.10	6.10	6.10	6.10
HILL	3	6.10	6.10	6.10	6.10	6.10	6.20
HILL	3	6.40	6.40	6.40	6.40	6.70	6.70
HILL	3	6.70	6.70	6.70			
HILL	4	6.10	6.10	6.10	6.10	6.10	6.10
HILL	4	6.10	6.10	6.10	6.10	6.10	6.20
HILL	4	6.40	6.40	6.40	6.40	6.70	6.70
HILL	4	6.70	6.70	6.70			
HILL	5	6.10	6.10	6.10	6.10	6.10	6.10
HILL	5	6.10	6.10	6.10	6.10	6.10	6.30
HILL	5	6.40	6.40	6.40	6.60	6.70	6.70
HILL	5	6.70	6.70	6.70			
HILL	6	6.10	6.10	6.10	6.10	6.10	6.10
HILL	6	6.10	6.10	6.10	6.10	6.20	6.40
HILL	6	6.40	6.40	6.40	6.70	6.70	6.70
HILL	6	6.70	6.70	6.70			
HILL	7	6.10	6.10	6.10	6.10	6.10	6.10
HILL	7	6.10	6.10	6.10	6.10	6.30	6.40
HILL	7	6.40	6.40	6.40	6.70	6.70	6.70
HILL	7	6.70	6.70	6.70			
HILL	8	6.10	6.10	6.10	6.10	6.10	6.10
HILL	8	6.10	6.10	6.10	6.20	6.40	6.40
HILL	8	6.40	6.40	6.50	6.70	6.70	6.70
HILL	8	6.70	6.80	6.80			
HILL	9	6.10	6.10	6.10	6.10	6.10	6.10
HILL	9	6.10	6.10	6.10	6.30	6.40	6.40
HILL	9	6.40	6.40	6.60	6.70	6.70	6.70
HILL	9	6.70	6.90	7.00			
HILL	10	6.10	6.10	6.10	6.10	6.10	6.10
HILL	10	6.10	6.10	6.10	6.40	6.40	6.40
HILL	10	6.40	6.50	6.70	6.70	6.70	6.70
HILL	10	6.80	7.00	7.00			
HILL	11	6.10	6.10	6.10	6.10	6.10	6.10
HILL	11	6.10	6.10	6.20	6.40	6.40	6.40
HILL	11	6.40	6.50	6.70	6.70	6.70	6.70
HILL	11	6.80	7.00	7.00			
HILL	12	6.10	6.10	6.10	6.10	6.10	6.10
HILL	12	6.10	6.10	6.40	6.40	6.40	6.40
HILL	12	6.40	6.70	6.70	6.70	6.70	6.70
HILL	12	6.80	7.00	7.00			
HILL	13	6.10	6.10	6.10	6.10	6.10	6.10
HILL	13	6.10	6.20	6.40	6.40	6.40	6.40
HILL	13	6.50	6.70	6.70	6.70	6.70	6.70
HILL	13	6.80	7.00	7.00			
HILL	14	6.10	6.10	6.10	6.10	6.10	6.10
HILL	14	6.10	6.40	6.40	6.40	6.40	6.40
HILL	14	6.70	6.70	6.70	6.70	6.70	6.70
HILL	14	6.80	7.00	7.00			
HILL	15	6.10	6.10	6.10	6.10	6.10	6.10
HILL	15	6.20	6.40	6.40	6.40	6.40	6.60
HILL	15	6.70	6.70	6.70	6.70	6.70	6.70
HILL	15	6.90	7.00	7.00			
HILL	16	6.10	6.10	6.10	6.10	6.10	6.20
HILL	16	6.30	6.40	6.40	6.40	6.50	6.70
HILL	16	6.70	6.70	6.70	6.70	6.70	6.70
HILL	16	7.00	7.00	7.00			
HILL	17	6.10	6.10	6.10	6.10	6.10	6.30
HILL	17	6.40	6.40	6.40	6.40	6.60	6.70

```
                HILL    17      6.70    6.70    6.70    6.70    6.70    6.70
                HILL    17      7.00    7.00    7.00
                HILL    18      6.10    6.10    6.10    6.10    6.20    6.40
                HILL    18      6.40    6.40    6.40    6.50    6.70    6.70
                HILL    18      6.70    6.70    6.70    6.70    6.70    6.80
                HILL    18      7.00    7.00    7.00
                HILL    19      6.10    6.10    6.10    6.10    6.30    6.40
                HILL    19      6.40    6.40    6.40    6.60    6.70    6.70
                HILL    19      6.70    6.70    6.70    6.70    6.70    7.00
                HILL    19      7.00    7.00    7.00
                HILL    20      6.10    6.10    6.10    6.30    6.40    6.40
                HILL    20      6.40    6.40    6.40    6.70    6.70    6.70
                HILL    20      6.70    6.70    6.70    6.70    6.80    7.00
                HILL    20      7.00    7.00    7.00
                HILL    21      6.10    6.10    6.10    6.40    6.40    6.40
                HILL    21      6.40    6.40    6.50    6.70    6.70    6.70
                HILL    21      6.70    6.70    6.70    6.70    6.90    7.00
                HILL    21      7.00    7.00    7.00
GRIDCART UCART3 END
GRIDCART UCART4 STA
                XYINC 632647.92 21 12.92 4262992.92 21 27.97
                ELEV    1       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    1       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    1       5.50    5.60    5.70    5.80    5.80    5.80
                ELEV    1       5.80    5.80    5.80
                ELEV    2       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    2       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    2       5.70    5.80    5.80    5.80    5.80    5.80
                ELEV    2       5.80    5.80    5.80
                ELEV    3       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    3       5.50    5.50    5.50    5.50    5.50    5.60
                ELEV    3       5.70    5.80    5.80    5.80    5.80    5.80
                ELEV    3       5.80    5.80    5.80
                ELEV    4       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    4       5.50    5.50    5.50    5.60    5.70    5.80
                ELEV    4       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    4       5.80    5.80    5.80
                ELEV    5       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    5       5.50    5.50    5.50    5.60    5.70    5.80
                ELEV    5       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    5       5.80    5.80    5.80
                ELEV    6       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    6       5.50    5.60    5.70    5.80    5.80    5.80
                ELEV    6       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    6       5.80    5.80    5.80
                ELEV    7       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    7       5.50    5.60    5.80    5.80    5.80    5.80
                ELEV    7       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    7       5.80    5.80    5.80
                ELEV    8       5.50    5.50    5.50    5.50    5.50    5.60
                ELEV    8       5.70    5.80    5.80    5.80    5.80    5.80
                ELEV    8       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    8       5.80    5.80    5.80
                ELEV    9       5.50    5.50    5.50    5.50    5.50    5.70
                ELEV    9       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    9       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    9       5.80    5.80    5.80
                ELEV   10       5.50    5.50    5.50    5.50    5.50    5.70
```

ELEV	10	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	10	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	10	5.80	5.80	5.80			
ELEV	11	5.50	5.50	5.50	5.60	5.70	5.70
ELEV	11	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	11	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	11	5.80	5.90	6.00			
ELEV	12	5.50	5.50	5.60	5.70	5.80	5.80
ELEV	12	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	12	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	12	5.90	6.00	6.10			
ELEV	13	5.50	5.50	5.60	5.70	5.80	5.80
ELEV	13	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	13	5.80	5.80	5.80	5.80	5.80	5.90
ELEV	13	6.00	6.00	6.10			
ELEV	14	5.50	5.60	5.70	5.70	5.80	5.80
ELEV	14	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	14	5.80	5.80	5.80	5.80	5.90	6.00
ELEV	14	6.10	6.10	6.10			
ELEV	15	5.60	5.80	5.80	5.80	5.80	5.80
ELEV	15	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	15	5.80	5.80	5.80	5.80	5.90	6.00
ELEV	15	6.10	6.10	6.10			
ELEV	16	5.70	5.80	5.80	5.80	5.80	5.80
ELEV	16	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	16	5.80	5.80	5.80	5.90	5.90	6.00
ELEV	16	6.10	6.10	6.10			
ELEV	17	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	17	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	17	5.80	5.90	6.00	6.10	6.10	6.10
ELEV	17	6.10	6.10	6.10			
ELEV	18	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	18	5.80	5.80	5.80	5.80	5.80	5.90
ELEV	18	6.00	6.10	6.10	6.10	6.10	6.10
ELEV	18	6.10	6.10	6.10			
ELEV	19	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	19	5.80	5.80	5.80	5.90	6.00	6.10
ELEV	19	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	19	6.10	6.10	6.10			
ELEV	20	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	20	5.80	5.80	5.80	5.90	6.00	6.10
ELEV	20	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	20	6.10	6.10	6.10			
ELEV	21	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	21	5.80	5.80	5.80	5.90	6.00	6.10
ELEV	21	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	21	6.10	6.10	6.10			
HILL	1	5.50	5.50	5.50	5.50	5.50	5.50
HILL	1	5.50	5.50	5.50	5.50	5.50	5.50
HILL	1	5.50	5.60	5.70	5.80	5.80	5.80
HILL	1	5.80	5.80	5.80			
HILL	2	5.50	5.50	5.50	5.50	5.50	5.50
HILL	2	5.50	5.50	5.50	5.50	5.50	5.50
HILL	2	5.70	5.80	5.80	5.80	5.80	5.80
HILL	2	5.80	5.80	5.80			
HILL	3	5.50	5.50	5.50	5.50	5.50	5.50
HILL	3	5.50	5.50	5.50	5.50	5.50	5.60
HILL	3	5.70	5.80	5.80	5.80	5.80	5.80

HILL	3	5.80	5.80	5.80			
HILL	4	5.50	5.50	5.50	5.50	5.50	5.50
HILL	4	5.50	5.50	5.50	5.60	5.70	5.80
HILL	4	5.80	5.80	5.80	5.80	5.80	5.80
HILL	4	5.80	5.80	5.80			
HILL	5	5.50	5.50	5.50	5.50	5.50	5.50
HILL	5	5.50	5.50	5.50	5.60	5.70	5.80
HILL	5	5.80	5.80	5.80	5.80	5.80	5.80
HILL	5	5.80	5.80	5.80			
HILL	6	5.50	5.50	5.50	5.50	5.50	5.50
HILL	6	5.50	5.60	5.70	5.80	5.80	5.80
HILL	6	5.80	5.80	5.80	5.80	5.80	5.80
HILL	6	5.80	5.80	5.80			
HILL	7	5.50	5.50	5.50	5.50	5.50	5.50
HILL	7	5.50	5.60	5.80	5.80	5.80	5.80
HILL	7	5.80	5.80	5.80	5.80	5.80	5.80
HILL	7	5.80	5.80	5.80			
HILL	8	5.50	5.50	5.50	5.50	5.50	5.60
HILL	8	5.70	5.80	5.80	5.80	5.80	5.80
HILL	8	5.80	5.80	5.80	5.80	5.80	5.80
HILL	8	5.80	5.80	5.80			
HILL	9	5.50	5.50	5.50	5.50	5.50	5.70
HILL	9	5.80	5.80	5.80	5.80	5.80	5.80
HILL	9	5.80	5.80	5.80	5.80	5.80	5.80
HILL	9	5.80	5.80	5.80			
HILL	10	5.50	5.50	5.50	5.50	5.50	5.70
HILL	10	5.80	5.80	5.80	5.80	5.80	5.80
HILL	10	5.80	5.80	5.80	5.80	5.80	5.80
HILL	10	5.80	5.80	5.80			
HILL	11	5.50	5.50	5.50	5.60	5.70	5.70
HILL	11	5.80	5.80	5.80	5.80	5.80	5.80
HILL	11	5.80	5.80	5.80	5.80	5.80	5.80
HILL	11	5.80	5.90	6.00			
HILL	12	5.50	5.50	5.60	5.70	5.80	5.80
HILL	12	5.80	5.80	5.80	5.80	5.80	5.80
HILL	12	5.80	5.80	5.80	5.80	5.80	5.80
HILL	12	5.90	6.00	6.10			
HILL	13	5.50	5.50	5.60	5.70	5.80	5.80
HILL	13	5.80	5.80	5.80	5.80	5.80	5.80
HILL	13	5.80	5.80	5.80	5.80	5.80	5.90
HILL	13	6.00	6.00	6.10			
HILL	14	5.50	5.60	5.70	5.70	5.80	5.80
HILL	14	5.80	5.80	5.80	5.80	5.80	5.80
HILL	14	5.80	5.80	5.80	5.80	5.90	6.00
HILL	14	6.10	6.10	6.10			
HILL	15	5.60	5.80	5.80	5.80	5.80	5.80
HILL	15	5.80	5.80	5.80	5.80	5.80	5.80
HILL	15	5.80	5.80	5.80	5.80	5.90	6.00
HILL	15	6.10	6.10	6.10			
HILL	16	5.70	5.80	5.80	5.80	5.80	5.80
HILL	16	5.80	5.80	5.80	5.80	5.80	5.80
HILL	16	5.80	5.80	5.80	5.90	5.90	6.00
HILL	16	6.10	6.10	6.10			
HILL	17	5.80	5.80	5.80	5.80	5.80	5.80
HILL	17	5.80	5.80	5.80	5.80	5.80	5.80
HILL	17	5.80	5.90	6.00	6.10	6.10	6.10
HILL	17	6.10	6.10	6.10			
HILL	18	5.80	5.80	5.80	5.80	5.80	5.80

```
                HILL    18      5.80    5.80    5.80    5.80    5.80    5.90
                HILL    18      6.00    6.10    6.10    6.10    6.10    6.10
                HILL    18      6.10    6.10    6.10
                HILL    19      5.80    5.80    5.80    5.80    5.80    5.80
                HILL    19      5.80    5.80    5.80    5.90    6.00    6.10
                HILL    19      6.10    6.10    6.10    6.10    6.10    6.10
                HILL    19      6.10    6.10    6.10
                HILL    20      5.80    5.80    5.80    5.80    5.80    5.80
                HILL    20      5.80    5.80    5.80    5.90    6.00    6.10
                HILL    20      6.10    6.10    6.10    6.10    6.10    6.10
                HILL    20      6.10    6.10    6.10
                HILL    21      5.80    5.80    5.80    5.80    5.80    5.80
                HILL    21      5.80    5.80    5.80    5.90    6.00    6.10
                HILL    21      6.10    6.10    6.10    6.10    6.10    6.10
                HILL    21      6.10    6.10    6.10
GRIDCART UCART4 END
GRIDCART UCART5 STA
                XYINC 632895.66 21 4.26 4262976.93 21 25.44
                ELEV    1       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    1       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    1       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    1       5.90    5.90    5.90
                ELEV    2       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    2       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    2       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    2       5.90    5.90    6.00
                ELEV    3       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    3       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    3       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    3       5.90    5.90    6.00
                ELEV    4       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    4       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    4       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    4       5.90    5.90    6.00
                ELEV    5       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    5       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    5       5.80    5.80    5.80    5.80    5.80    5.90
                ELEV    5       5.90    5.90    6.00
                ELEV    6       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    6       5.80    5.80    5.80    5.80    5.80    5.90
                ELEV    6       5.90    6.00    6.00    6.00    6.10    6.10
                ELEV    6       6.10    6.10    6.10
                ELEV    7       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    7       5.80    5.80    5.80    5.80    5.80    5.90
                ELEV    7       5.90    6.00    6.00    6.10    6.10    6.10
                ELEV    7       6.10    6.10    6.10
                ELEV    8       5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    8       5.80    5.80    5.80    5.80    5.80    5.90
                ELEV    8       5.90    6.00    6.00    6.10    6.10    6.10
                ELEV    8       6.10    6.10    6.10
                ELEV    9       5.80    5.80    5.80    5.80    5.80    5.90
                ELEV    9       5.90    5.90    5.90    5.90    6.00    6.00
                ELEV    9       6.00    6.00    6.10    6.10    6.10    6.10
                ELEV    9       6.10    6.10    6.10
                ELEV    10      5.80    5.80    5.80    5.80    5.90    5.90
                ELEV    10      6.00    6.00    6.10    6.10    6.10    6.10
                ELEV    10      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    10      6.10    6.10    6.10
```

ELEV	11	5.80	5.80	5.80	5.80	5.90	5.90
ELEV	11	6.00	6.00	6.10	6.10	6.10	6.10
ELEV	11	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	11	6.10	6.10	6.10			
ELEV	12	5.80	5.80	5.80	5.90	5.90	5.90
ELEV	12	6.00	6.00	6.10	6.10	6.10	6.10
ELEV	12	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	12	6.10	6.10	6.10			
ELEV	13	6.00	6.00	6.10	6.10	6.10	6.10
ELEV	13	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	13	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	13	6.10	6.10	6.10			
ELEV	14	6.00	6.10	6.10	6.10	6.10	6.10
ELEV	14	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	14	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	14	6.10	6.10	6.10			
ELEV	15	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	15	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	15	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	15	6.10	6.10	6.10			
ELEV	16	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	16	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	16	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	16	6.10	6.10	6.10			
ELEV	17	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	17	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	17	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	17	6.10	6.10	6.10			
ELEV	18	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	18	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	18	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	18	6.10	6.10	6.10			
ELEV	19	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	19	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	19	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	19	6.10	6.10	6.10			
ELEV	20	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	20	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	20	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	20	6.10	6.10	6.10			
ELEV	21	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	21	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	21	6.10	6.10	6.10	6.10	6.10	6.10
ELEV	21	6.10	6.10	6.10			
HILL	1	5.80	5.80	5.80	5.80	5.80	5.80
HILL	1	5.80	5.80	5.80	5.80	5.80	5.80
HILL	1	5.80	5.80	5.80	5.80	5.80	5.80
HILL	1	5.90	5.90	5.90			
HILL	2	5.80	5.80	5.80	5.80	5.80	5.80
HILL	2	5.80	5.80	5.80	5.80	5.80	5.80
HILL	2	5.80	5.80	5.80	5.80	5.80	5.80
HILL	2	5.90	5.90	6.00			
HILL	3	5.80	5.80	5.80	5.80	5.80	5.80
HILL	3	5.80	5.80	5.80	5.80	5.80	5.80
HILL	3	5.80	5.80	5.80	5.80	5.80	5.80
HILL	3	5.90	5.90	6.00			
HILL	4	5.80	5.80	5.80	5.80	5.80	5.80
HILL	4	5.80	5.80	5.80	5.80	5.80	5.80

HILL	4	5.80	5.80	5.80	5.80	5.80	5.80
HILL	4	5.90	5.90	6.00			
HILL	5	5.80	5.80	5.80	5.80	5.80	5.80
HILL	5	5.80	5.80	5.80	5.80	5.80	5.80
HILL	5	5.80	5.80	5.80	5.80	5.80	5.90
HILL	5	5.90	5.90	6.00			
HILL	6	5.80	5.80	5.80	5.80	5.80	5.80
HILL	6	5.80	5.80	5.80	5.80	5.80	5.90
HILL	6	5.90	6.00	6.00	6.00	6.10	6.10
HILL	6	6.10	6.10	6.10			
HILL	7	5.80	5.80	5.80	5.80	5.80	5.80
HILL	7	5.80	5.80	5.80	5.80	5.80	5.90
HILL	7	5.90	6.00	6.00	6.10	6.10	6.10
HILL	7	6.10	6.10	6.10			
HILL	8	5.80	5.80	5.80	5.80	5.80	5.80
HILL	8	5.80	5.80	5.80	5.80	5.80	5.90
HILL	8	5.90	6.00	6.00	6.10	6.10	6.10
HILL	8	6.10	6.10	6.10			
HILL	9	5.80	5.80	5.80	5.80	5.80	5.90
HILL	9	5.90	5.90	5.90	5.90	6.00	6.00
HILL	9	6.00	6.00	6.10	6.10	6.10	6.10
HILL	9	6.10	6.10	6.10			
HILL	10	5.80	5.80	5.80	5.80	5.90	5.90
HILL	10	6.00	6.00	6.10	6.10	6.10	6.10
HILL	10	6.10	6.10	6.10	6.10	6.10	6.10
HILL	10	6.10	6.10	6.10			
HILL	11	5.80	5.80	5.80	5.80	5.90	5.90
HILL	11	6.00	6.00	6.10	6.10	6.10	6.10
HILL	11	6.10	6.10	6.10	6.10	6.10	6.10
HILL	11	6.10	6.10	6.10			
HILL	12	5.80	5.80	5.80	5.90	5.90	5.90
HILL	12	6.00	6.00	6.10	6.10	6.10	6.10
HILL	12	6.10	6.10	6.10	6.10	6.10	6.10
HILL	12	6.10	6.10	6.10			
HILL	13	6.00	6.00	6.10	6.10	6.10	6.10
HILL	13	6.10	6.10	6.10	6.10	6.10	6.10
HILL	13	6.10	6.10	6.10	6.10	6.10	6.10
HILL	13	6.10	6.10	6.10			
HILL	14	6.00	6.10	6.10	6.10	6.10	6.10
HILL	14	6.10	6.10	6.10	6.10	6.10	6.10
HILL	14	6.10	6.10	6.10	6.10	6.10	6.10
HILL	14	6.10	6.10	6.10			
HILL	15	6.10	6.10	6.10	6.10	6.10	6.10
HILL	15	6.10	6.10	6.10	6.10	6.10	6.10
HILL	15	6.10	6.10	6.10	6.10	6.10	6.10
HILL	15	6.10	6.10	6.10			
HILL	16	6.10	6.10	6.10	6.10	6.10	6.10
HILL	16	6.10	6.10	6.10	6.10	6.10	6.10
HILL	16	6.10	6.10	6.10	6.10	6.10	6.10
HILL	16	6.10	6.10	6.10			
HILL	17	6.10	6.10	6.10	6.10	6.10	6.10
HILL	17	6.10	6.10	6.10	6.10	6.10	6.10
HILL	17	6.10	6.10	6.10	6.10	6.10	6.10
HILL	17	6.10	6.10	6.10			
HILL	18	6.10	6.10	6.10	6.10	6.10	6.10
HILL	18	6.10	6.10	6.10	6.10	6.10	6.10
HILL	18	6.10	6.10	6.10	6.10	6.10	6.10
HILL	18	6.10	6.10	6.10			

```
                HILL   19     6.10    6.10    6.10    6.10    6.10    6.10
                HILL   19     6.10    6.10    6.10    6.10    6.10    6.10
                HILL   19     6.10    6.10    6.10    6.10    6.10    6.10
                HILL   19     6.10    6.10    6.10
                HILL   20     6.10    6.10    6.10    6.10    6.10    6.10
                HILL   20     6.10    6.10    6.10    6.10    6.10    6.10
                HILL   20     6.10    6.10    6.10    6.10    6.10    6.10
                HILL   20     6.10    6.10    6.10
                HILL   21     6.10    6.10    6.10    6.10    6.10    6.10
                HILL   21     6.10    6.10    6.10    6.10    6.10    6.10
                HILL   21     6.10    6.10    6.10    6.10    6.10    6.10
                HILL   21     6.10    6.10    6.10
GRIDCART UCART5 END
GRIDCART UCART6 STA
                XYINC 632607.96 21 13.32 4263554.98 21 32.37
                ELEV    1      5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    1      5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    1      5.90    6.10    6.10    6.10    6.10    6.10
                ELEV    1      6.10    6.10    6.10
                ELEV    2      5.80    5.80    5.80    5.80    5.80    5.80
                ELEV    2      5.80    5.80    5.80    5.90    6.00    6.10
                ELEV    2      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    2      6.10    6.10    6.10
                ELEV    3      6.10    5.90    5.80    5.80    5.80    5.80
                ELEV    3      5.80    5.90    6.00    6.10    6.10    6.10
                ELEV    3      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    3      6.10    6.10    6.10
                ELEV    4      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    4      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    4      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    4      6.10    6.10    6.10
                ELEV    5      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    5      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    5      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    5      6.10    6.10    6.10
                ELEV    6      6.20    6.20    6.20    6.20    6.20    6.20
                ELEV    6      6.20    6.20    6.10    6.10    6.10    6.10
                ELEV    6      6.10    6.10    6.10    6.10    6.10    6.10
                ELEV    6      6.10    6.10    6.10
                ELEV    7      6.40    6.40    6.40    6.40    6.40    6.40
                ELEV    7      6.40    6.40    6.30    6.20    6.20    6.20
                ELEV    7      6.20    6.10    6.10    6.10    6.10    6.10
                ELEV    7      6.10    6.10    6.10
                ELEV    8      6.40    6.40    6.40    6.40    6.40    6.40
                ELEV    8      6.40    6.40    6.50    6.50    6.50    6.40
                ELEV    8      6.30    6.30    6.20    6.10    6.10    6.10
                ELEV    8      6.10    6.10    6.10
                ELEV    9      6.40    6.50    6.60    6.60    6.60    6.60
                ELEV    9      6.60    6.60    6.70    6.70    6.60    6.60
                ELEV    9      6.60    6.60    6.40    6.20    6.10    6.10
                ELEV    9      6.10    6.10    6.10
                ELEV   10      6.60    6.70    6.70    6.70    6.70    6.70
                ELEV   10      6.70    6.80    6.90    6.90    6.90    6.90
                ELEV   10      7.00    7.10    7.20    7.20    7.00    6.60
                ELEV   10      6.40    6.60    6.70
                ELEV   11      6.70    6.70    6.70    6.80    6.90    6.90
                ELEV   11      6.90    7.00    7.00    7.00    7.10    7.30
                ELEV   11      7.40    7.50    7.60    7.60    7.60    7.40
```

ELEV	11	7.40	7.40	7.50			
ELEV	12	6.70	6.90	7.00	7.00	7.00	7.00
ELEV	12	7.00	7.10	7.20	7.30	7.30	7.30
ELEV	12	7.50	7.60	7.60	7.60	7.60	7.60
ELEV	12	7.60	7.60	7.60			
ELEV	13	7.00	7.00	7.00	7.00	7.00	7.10
ELEV	13	7.20	7.30	7.30	7.40	7.50	7.60
ELEV	13	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	13	7.60	7.60	7.60			
ELEV	14	7.00	7.00	7.00	7.00	7.00	7.10
ELEV	14	7.30	7.30	7.30	7.40	7.50	7.60
ELEV	14	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	14	7.60	7.60	7.60			
ELEV	15	7.00	7.00	7.00	7.00	7.00	7.10
ELEV	15	7.30	7.30	7.30	7.40	7.50	7.60
ELEV	15	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	15	7.60	7.60	7.60			
ELEV	16	7.00	7.00	7.00	7.20	7.30	7.30
ELEV	16	7.30	7.40	7.50	7.60	7.60	7.60
ELEV	16	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	16	7.60	7.60	7.60			
ELEV	17	7.00	7.00	7.00	7.20	7.30	7.30
ELEV	17	7.30	7.40	7.50	7.60	7.60	7.60
ELEV	17	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	17	7.60	7.60	7.50			
ELEV	18	7.00	7.00	7.00	7.20	7.30	7.30
ELEV	18	7.30	7.40	7.50	7.60	7.60	7.60
ELEV	18	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	18	7.60	7.40	7.30			
ELEV	19	6.90	7.00	7.00	7.20	7.30	7.40
ELEV	19	7.40	7.50	7.60	7.60	7.60	7.60
ELEV	19	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	19	7.60	7.40	7.30			
ELEV	20	6.70	6.80	6.90	7.00	7.10	7.30
ELEV	20	7.50	7.60	7.60	7.60	7.60	7.60
ELEV	20	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	20	7.60	7.40	7.30			
ELEV	21	6.60	6.60	6.70	6.80	7.00	7.20
ELEV	21	7.40	7.50	7.60	7.60	7.60	7.60
ELEV	21	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	21	7.60	7.40	7.30			
HILL	1	5.80	5.80	5.80	5.80	5.80	5.80
HILL	1	5.80	5.80	5.80	5.80	5.80	5.80
HILL	1	5.90	6.10	6.10	6.10	6.10	6.10
HILL	1	6.10	6.10	6.10			
HILL	2	5.80	5.80	5.80	5.80	5.80	5.80
HILL	2	5.80	5.80	5.80	5.90	6.00	6.10
HILL	2	6.10	6.10	6.10	6.10	6.10	6.10
HILL	2	6.10	6.10	6.10			
HILL	3	6.10	5.90	5.80	5.80	5.80	5.80
HILL	3	5.80	5.90	6.00	6.10	6.10	6.10
HILL	3	6.10	6.10	6.10	6.10	6.10	6.10
HILL	3	6.10	6.10	6.10			
HILL	4	6.10	6.10	6.10	6.10	6.10	6.10
HILL	4	6.10	6.10	6.10	6.10	6.10	6.10
HILL	4	6.10	6.10	6.10	6.10	6.10	6.10
HILL	4	6.10	6.10	6.10			
HILL	5	6.10	6.10	6.10	6.10	6.10	6.10

HILL	5	6.10	6.10	6.10	6.10	6.10	6.10
HILL	5	6.10	6.10	6.10	6.10	6.10	6.10
HILL	5	6.10	6.10	6.10			
HILL	6	6.20	6.20	6.20	6.20	6.20	6.20
HILL	6	6.20	6.20	6.10	6.10	6.10	6.10
HILL	6	6.10	6.10	6.10	6.10	6.10	6.10
HILL	6	6.10	6.10	6.10			
HILL	7	6.40	6.40	6.40	6.40	6.40	6.40
HILL	7	6.40	6.40	6.30	6.20	6.20	6.20
HILL	7	6.20	6.10	6.10	6.10	6.10	6.10
HILL	7	6.10	6.10	6.10			
HILL	8	6.40	6.40	6.40	6.40	6.40	6.40
HILL	8	6.40	6.40	6.50	6.50	6.50	6.40
HILL	8	6.30	6.30	6.20	6.10	6.10	6.10
HILL	8	6.10	6.10	6.10			
HILL	9	6.40	6.50	6.60	6.60	6.60	6.60
HILL	9	6.60	6.60	6.70	6.70	6.60	6.60
HILL	9	6.60	6.60	6.40	6.20	6.10	6.10
HILL	9	6.10	6.10	6.10			
HILL	10	6.60	6.70	6.70	6.70	6.70	6.70
HILL	10	6.70	6.80	6.90	6.90	6.90	6.90
HILL	10	7.00	7.10	7.20	7.20	7.00	6.60
HILL	10	6.40	6.60	6.70			
HILL	11	6.70	6.70	6.70	6.80	6.90	6.90
HILL	11	6.90	7.00	7.00	7.00	7.10	7.30
HILL	11	7.40	7.50	7.60	7.60	7.60	7.40
HILL	11	7.40	7.40	7.50			
HILL	12	6.70	6.90	7.00	7.00	7.00	7.00
HILL	12	7.00	7.10	7.20	7.30	7.30	7.30
HILL	12	7.50	7.60	7.60	7.60	7.60	7.60
HILL	12	7.60	7.60	7.60			
HILL	13	7.00	7.00	7.00	7.00	7.00	7.10
HILL	13	7.20	7.30	7.30	7.40	7.50	7.60
HILL	13	7.60	7.60	7.60	7.60	7.60	7.60
HILL	13	7.60	7.60	7.60			
HILL	14	7.00	7.00	7.00	7.00	7.00	7.10
HILL	14	7.30	7.30	7.30	7.40	7.50	7.60
HILL	14	7.60	7.60	7.60	7.60	7.60	7.60
HILL	14	7.60	7.60	7.60			
HILL	15	7.00	7.00	7.00	7.00	7.00	7.10
HILL	15	7.30	7.30	7.30	7.40	7.50	7.60
HILL	15	7.60	7.60	7.60	7.60	7.60	7.60
HILL	15	7.60	7.60	7.60			
HILL	16	7.00	7.00	7.00	7.20	7.30	7.30
HILL	16	7.30	7.40	7.50	7.60	7.60	7.60
HILL	16	7.60	7.60	7.60	7.60	7.60	7.60
HILL	16	7.60	7.60	7.60			
HILL	17	7.00	7.00	7.00	7.20	7.30	7.30
HILL	17	7.30	7.40	7.50	7.60	7.60	7.60
HILL	17	7.60	7.60	7.60	7.60	7.60	7.60
HILL	17	7.60	7.60	7.50			
HILL	18	7.00	7.00	7.00	7.20	7.30	7.30
HILL	18	7.30	7.40	7.50	7.60	7.60	7.60
HILL	18	7.60	7.60	7.60	7.60	7.60	7.60
HILL	18	7.60	7.40	7.30			
HILL	19	6.90	7.00	7.00	7.20	7.30	7.40
HILL	19	7.40	7.50	7.60	7.60	7.60	7.60
HILL	19	7.60	7.60	7.60	7.60	7.60	7.60

```
                    HILL   19      7.60      7.40      7.30
                    HILL   20      6.70      6.80      6.90      7.00      7.10      7.30
                    HILL   20      7.50      7.60      7.60      7.60      7.60      7.60
                    HILL   20      7.60      7.60      7.60      7.60      7.60      7.60
                    HILL   20      7.60      7.40      7.30
                    HILL   21      6.60      6.60      6.70      6.80      7.00      7.20
                    HILL   21      7.40      7.50      7.60      7.60      7.60      7.60
                    HILL   21      7.60      7.60      7.60      7.60      7.60      7.60
                    HILL   21      7.60      7.40      7.30
   GRIDCART UCART6 END
RE FINISHED
**
**********************************
** AERMOD Meteorology Pathway
**********************************
**
**
ME STARTING
   SURFFILE "L:\SSD FOLDERS\Modeling\AermodMet 14134\Not 1 Minute Met
Data\Executive\10-14\Exec 10-14 N1MD.SFC"
   PROFFILE "L:\SSD FOLDERS\Modeling\AermodMet 14134\Not 1 Minute Met
Data\Executive\10-14\Exec 10-14 N1MD.PFL"
   SURFDATA 23232 2010 SACRAMENTO/EXECUTIVE_ARPT
   UAIRDATA 23230 2010 OAKLAND/WSO_AP
   PROFBASE 6.0 FEET
ME FINISHED
**
**********************************
** AERMOD Output Pathway
**********************************
**
**
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
** Auto-Generated Plotfiles
   PLOTFILE 1 ALL 1ST C:\25725nr\25725NR.AD\01H1GALL.PLT 31
   PLOTFILE 1 STK1 1ST C:\25725nr\25725NR.AD\01H1G001.PLT 32
   PLOTFILE PERIOD ALL C:\25725nr\25725NR.AD\PE00GALL.PLT 33
   PLOTFILE PERIOD STK1 C:\25725nr\25725NR.AD\PE00G000.PLT 34
OU FINISHED
**
**********************************
** Project Parameters
**********************************
** PROJCTN  CoordinateSystemUTM
** DESCPTN  UTM: Universal Transverse Mercator
** DATUM    World Geodetic System 1984
** DTMRGN   Global Definition
** UNITS    m
** ZONE     10
** ZONEINX  0
**
```


twood
MEIR 2.5 in a million Cancer, 3.08E-3 Chronic
Soin Estates
6.6E-3 Acute
Google Earth
© 2018 Google
N
1000 ft

HARP2 - HRACalc (dated 17023) 10/5/2018 11:00:27 AM - Output Log

GLCs loaded successfully
Pollutants loaded successfully
Pathway receptors loaded successfully
****
RISK SCENARIO SETTINGS

Receptor Type: Resident
Scenario: All
Calculation Method: Derived

****
EXPOSURE DURATION PARAMETERS FOR CANCER

Start Age: -0.25
Total Exposure Duration: 30

Exposure Duration Bin Distribution
3rd Trimester Bin: 0.25
0<2 Years Bin: 2
2<9 Years Bin: 0
2<16 Years Bin: 14
16<30 Years Bin: 14
16 to 70 Years Bin: 0

****
PATHWAYS ENABLED

NOTE: Inhalation is always enabled and used for all assessments. The remaining pathways are only used for cancer and noncancer chronic assessments.

Inhalation: True
Soil: True
Dermal: True
Mother's milk: True
Water: False
Fish: False
Homegrown crops: False
Beef: False
Dairy: False
Pig: False
Chicken: False
Egg: False

****
INHALATION

Daily breathing rate: RMP

Worker Adjustment Factors
Worker adjustment factors enabled: NO

Fraction at time at home
3rd Trimester to 16 years: OFF
16 years to 70 years: ON

****
SOIL & DERMAL PATHWAY SETTINGS

```
Deposition rate (m/s): 0.05
Soil mixing depth (m): 0.01
Dermal climate: Mixed

**********
TIER 2 SETTINGS
Tier2 not used.

**********

Calculating cancer risk
Cancer risk breakdown by pollutant and receptor saved to:
C:\25725res\25725RESHARP\hra\25725resharpoutCancerRisk.csv
Cancer risk total by receptor saved to:
C:\25725res\25725RESHARP\hra\25725resharpoutCancerRiskSumByRec.csv
Calculating chronic risk
Chronic risk breakdown by pollutant and receptor saved to:
C:\25725res\25725RESHARP\hra\25725resharpoutNCChronicRisk.csv
Chronic risk total by receptor saved to:
C:\25725res\25725RESHARP\hra\25725resharpoutNCChronicRiskSumByRec.csv
Calculating acute risk
Acute risk breakdown by pollutant and receptor saved to:
C:\25725res\25725RESHARP\hra\25725resharpoutNCAcuteRisk.csv
Acute risk total by receptor saved to:
C:\25725res\25725RESHARP\hra\25725resharpoutNCAcuteRiskSumByRec.csv
HRA ran successfully
```

HARP Project Summary Report 11/9/2018 11:04:15 AM

PROJECT INFORMATION
HARP Version: 18159
Project Name: 25725RESHARP
Project Output Directory: C:\25725res\25725RESHARP
HARP Database: NA

FACILITY INFORMATION
Origin
X (m):0
Y (m):0
Zone:1
No. of Sources:0
No. of Buildings:0

EMISSION INVENTORY
No. of Pollutants:12
No. of Background Pollutants:0

Emissions

ScrID	StkID	ProID	PolID	PolAbbrev	Multi	Annual Ems (lbs/yr)	MaxHr Ems (lbs/hr)	MWAF
stck1	0	0	106990	1,3-Butadiene	1	6.06	0.000692	1
stck1	0	0	75070	Acetaldehyde	1	564	0.0644	1
stck1	0	0	107028	Acrolein	1	90.3	0.0103	1
stck1	0	0	71432	Benzene	1	169	0.0193	1
stck1	0	0	100414	Ethyl Benzene	1	451	0.0515	1
stck1	0	0	50000	Formaldehyde	1	10000	1.14	1
stck1	0	0	91203	Naphthalene	1	18.3	0.00209	1
stck1	0	0	1151	PAHs-w/o	1	31	0.00354	1
stck1	0	0	75569	Propylene Oxide	1	409	0.0467	1
stck1	0	0	108883	Toluene	1	1830	0.209	1
stck1	0	0	1330207	Xylenes	1	903	0.103	1
stck1	0	0	7664417	NH3	1	192334.8832	21.956	1

Background

PolID	PolAbbrev	Conc (ug/m^3)	MWAF

Ground level concentration files (\glc\)

100414MAXHR.txt
100414PER.txt
106990MAXHR.txt
106990PER.txt
107028MAXHR.txt
107028PER.txt
108883MAXHR.txt
108883PER.txt
1151MAXHR.txt
1151PER.txt
1330207MAXHR.txt
1330207PER.txt
50000MAXHR.txt
50000PER.txt
71432MAXHR.txt
71432PER.txt

75070MAXHR.txt
75070PER.txt
75569MAXHR.txt
75569PER.txt
7664417MAXHR.txt
7664417PER.txt
91203MAXHR.txt
91203PER.txt

POLLUTANT HEALTH INFORMATION
Health Database: C:\HARP2\Tables\HEALTH17320.mdb
Health Table Version: HEALTH18121
Official: True

PolID	PolAbbrev	InhCancer	OralCancer	AcuteREL	InhChronicREL	OralChronicREL	InhChronic8HRREL
106990	1,3-Butadiene	0.6		660	2		9
75070	Acetaldehyde	0.01		470	140		300
107028	Acrolein			2.5	0.35		0.7
71432	Benzene	0.1		27	3		3
100414	Ethyl Benzene	0.0087			2000		
50000	Formaldehyde	0.021		55	9		9
91203	Naphthalene	0.12			9		
1151	PAHs-w/o	3.9	12				
75569	Propylene Oxide	0.013		3100	30		
108883	Toluene			37000	300		
1330207	Xylenes			22000	700		
7664417	NH3			3200	200		

AIR DISPERSION MODELING INFORMATION
Versions used in HARP. All executables were obtained from USEPA's Support Center for Regulatory Atmospheric Modeling website (http://www.epa.gov/scram001/)
AERMOD: 18081
AERMAP: 18081
BPIPPRM: 04274
AERPLOT: 13329

METEOROLOGICAL INFORMATION
Version:
Surface File:
Profile File:
Surface Station:
Upper Station:
On-Site Station:

LIST OF AIR DISPERSION FILES
AERMOD Input File:
AERMOD Output File:
AERMOD Error File:
Plotfile list

LIST OF RISK ASSESSMENT FILES
Health risk analysis files (\hra\)

25725resharpoutCancerRisk.csv
25725resharpoutCancerRiskSumByRec.csv
25725resharpoutGLCList.csv
25725resharpoutHRAInput.hra

25725resharpoutNCAcuteRisk.csv
25725resharpoutNCAcuteRiskSumByRec.csv
25725resharpoutNCChronicRisk.csv
25725resharpoutNCChronicRiskSumByRec.csv
25725resharpoutOutput.txt
25725resharpoutPathwayRec.csv
25725resharpoutPolDB.csv

Spatial averaging files (\sa\)

```
**
**************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.5.0
** Lakes Environmental Software Inc.
** Date: 11/9/2018
** File: C:\25725res\25725resinputfile2.inp
**
**************************************
**
**
**************************************
** AERMOD Control Pathway
**************************************
**
**
CO STARTING
   TITLEONE c:/SPA
   MODELOPT DFAULT CONC
   AVERTIME 1 PERIOD
   URBANOPT 466488 Sacramento
   POLLUTID SO2
   RUNORNOT RUN
CO FINISHED
**
**************************************
** AERMOD Source Pathway
**************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION STK1          POINT      633087.100  4263610.400         6.400
** Source Parameters **
   SRCPARAM STK1              1.0     30.480   388.706  18.52945      5.182

** Building Downwash **
   BUILDHGT STK1          22.08     22.08     22.08     22.08     22.08     22.08
   BUILDHGT STK1          22.08     22.08     22.08     22.08     22.08     22.08
   BUILDHGT STK1          22.08     22.08     22.08     22.08     22.08     22.08
   BUILDHGT STK1          22.08     22.08     22.08     22.08     22.08     22.08
   BUILDHGT STK1          22.08     22.08     22.08     22.08     22.08     22.08
   BUILDHGT STK1          22.08     22.08     22.08     22.08     22.08     22.08

   BUILDWID STK1          29.22     29.56     29.00     27.56     25.87     23.72
   BUILDWID STK1          20.84     17.33     13.30     17.33     20.84     23.72
   BUILDWID STK1          25.87     27.68     29.10     29.63     29.26     28.00
   BUILDWID STK1          29.22     29.56     29.00     27.56     25.87     23.72
   BUILDWID STK1          20.84     17.33     13.30     17.33     20.84     23.72
   BUILDWID STK1          25.87     27.68     29.10     29.63     29.26     28.00

   BUILDLEN STK1          17.33     20.84     23.72     25.87     27.68     29.10
   BUILDLEN STK1          29.63     29.26     28.00     29.22     29.56     29.00
   BUILDLEN STK1          27.56     25.87     23.72     20.84     17.33     13.30
   BUILDLEN STK1          17.33     20.84     23.72     25.87     27.68     29.10
   BUILDLEN STK1          29.63     29.26     28.00     29.22     29.56     29.00
```

```
    BUILDLEN STK1              27.56    25.87    23.72    20.84    17.33    13.30

    XBADJ    STK1              -9.63   -13.07   -16.11   -18.66   -20.65   -22.00
    XBADJ    STK1             -22.69   -22.69   -22.00   -22.95   -23.20   -22.75
    XBADJ    STK1             -21.61   -19.81   -17.41   -14.48   -11.11    -7.40
    XBADJ    STK1              -7.70    -7.77    -7.61    -7.21    -7.04    -7.10
    XBADJ    STK1              -6.94    -6.57    -6.00    -6.27    -6.36    -6.25
    XBADJ    STK1              -5.95    -6.06    -6.31    -6.37    -6.23    -5.90

    YBADJ    STK1               8.34     8.42     8.25     7.83     6.87     5.55
    YBADJ    STK1               4.06     2.44     0.75    -0.96    -2.65    -4.25
    YBADJ    STK1              -5.72    -6.80    -7.45    -7.88    -8.06    -8.00
    YBADJ    STK1              -8.34    -8.42    -8.25    -7.83    -6.87    -5.55
    YBADJ    STK1              -4.06    -2.44    -0.75     0.96     2.65     4.25
    YBADJ    STK1               5.72     6.80     7.45     7.88     8.06     8.00

    URBANSRC ALL
    SRCGROUP STK1      STK1
    SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
    GRIDCART UCART1 STA
                  XYINC 633665.59 21 22.48 4263575.08 21 39.61
                  ELEV    1     7.00     7.00     7.00     7.00     7.00     7.00
                  ELEV    1     7.00     7.20     7.30     7.30     7.40     7.50
                  ELEV    1     7.60     7.60     7.60     7.60     7.60     7.60
                  ELEV    1     7.60     7.60     7.60
                  ELEV    2     7.00     7.00     7.00     7.00     7.00     7.00
                  ELEV    2     7.00     7.20     7.30     7.30     7.30     7.30
                  ELEV    2     7.40     7.60     7.60     7.60     7.60     7.60
                  ELEV    2     7.60     7.60     7.60
                  ELEV    3     7.00     7.00     7.00     7.00     7.00     7.00
                  ELEV    3     7.10     7.20     7.30     7.30     7.30     7.30
                  ELEV    3     7.40     7.50     7.60     7.60     7.60     7.60
                  ELEV    3     7.60     7.60     7.60
                  ELEV    4     7.00     7.00     7.00     7.00     7.00     7.10
                  ELEV    4     7.30     7.30     7.30     7.30     7.30     7.30
                  ELEV    4     7.30     7.40     7.60     7.60     7.60     7.60
                  ELEV    4     7.60     7.60     7.60
                  ELEV    5     7.00     7.00     7.00     7.00     7.10     7.30
                  ELEV    5     7.30     7.30     7.30     7.30     7.30     7.30
                  ELEV    5     7.30     7.30     7.30     7.50     7.60     7.60
                  ELEV    5     7.60     7.60     7.60
                  ELEV    6     7.00     7.00     7.10     7.20     7.30     7.30
                  ELEV    6     7.30     7.30     7.30     7.30     7.30     7.30
                  ELEV    6     7.30     7.30     7.30     7.50     7.60     7.60
                  ELEV    6     7.60     7.60     7.60
                  ELEV    7     7.10     7.20     7.30     7.30     7.30     7.30
                  ELEV    7     7.30     7.30     7.30     7.30     7.30     7.30
                  ELEV    7     7.30     7.30     7.50     7.60     7.60     7.60
                  ELEV    7     7.60     7.60     7.60
                  ELEV    8     7.30     7.30     7.30     7.30     7.30     7.30
```

ELEV	8	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	8	7.40	7.60	7.60	7.60	7.60	7.60
ELEV	8	7.60	7.60	7.60			
ELEV	9	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	9	7.40	7.40	7.50	7.60	7.60	7.60
ELEV	9	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	9	7.60	7.60	7.60			
ELEV	10	7.30	7.30	7.30	7.40	7.50	7.50
ELEV	10	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	10	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	10	7.60	7.60	7.60			
ELEV	11	7.30	7.30	7.30	7.50	7.60	7.60
ELEV	11	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	11	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	11	7.60	7.60	7.60			
ELEV	12	7.30	7.40	7.60	7.60	7.60	7.60
ELEV	12	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	12	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	12	7.60	7.60	7.60			
ELEV	13	7.40	7.60	7.60	7.60	7.60	7.60
ELEV	13	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	13	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	13	7.60	7.60	7.60			
ELEV	14	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	14	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	14	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	14	7.60	7.60	7.60			
ELEV	15	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	15	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	15	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	15	7.60	7.60	7.60			
ELEV	16	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	16	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	16	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	16	7.60	7.60	7.60			
ELEV	17	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	17	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	17	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	17	7.60	7.60	7.60			
ELEV	18	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	18	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	18	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	18	7.60	7.60	7.60			
ELEV	19	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	19	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	19	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	19	7.60	7.60	7.60			
ELEV	20	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	20	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	20	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	20	7.60	7.60	7.60			
ELEV	21	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	21	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	21	7.60	7.60	7.60	7.60	7.60	7.60
ELEV	21	7.60	7.60	7.60			
HILL	1	7.00	7.00	7.00	7.00	7.00	7.00
HILL	1	7.00	7.20	7.30	7.30	7.40	7.50
HILL	1	7.60	7.60	7.60	7.60	7.60	7.60

HILL	1	7.60	7.60	7.60			
HILL	2	7.00	7.00	7.00	7.00	7.00	7.00
HILL	2	7.00	7.20	7.30	7.30	7.30	7.30
HILL	2	7.40	7.60	7.60	7.60	7.60	7.60
HILL	2	7.60	7.60	7.60			
HILL	3	7.00	7.00	7.00	7.00	7.00	7.00
HILL	3	7.10	7.20	7.30	7.30	7.30	7.30
HILL	3	7.40	7.50	7.60	7.60	7.60	7.60
HILL	3	7.60	7.60	7.60			
HILL	4	7.00	7.00	7.00	7.00	7.00	7.10
HILL	4	7.30	7.30	7.30	7.30	7.30	7.30
HILL	4	7.30	7.40	7.60	7.60	7.60	7.60
HILL	4	7.60	7.60	7.60			
HILL	5	7.00	7.00	7.00	7.00	7.10	7.30
HILL	5	7.30	7.30	7.30	7.30	7.30	7.30
HILL	5	7.30	7.30	7.30	7.50	7.60	7.60
HILL	5	7.60	7.60	7.60			
HILL	6	7.00	7.00	7.10	7.20	7.30	7.30
HILL	6	7.30	7.30	7.30	7.30	7.30	7.30
HILL	6	7.30	7.30	7.30	7.50	7.60	7.60
HILL	6	7.60	7.60	7.60			
HILL	7	7.10	7.20	7.30	7.30	7.30	7.30
HILL	7	7.30	7.30	7.30	7.30	7.30	7.30
HILL	7	7.30	7.30	7.50	7.60	7.60	7.60
HILL	7	7.60	7.60	7.60			
HILL	8	7.30	7.30	7.30	7.30	7.30	7.30
HILL	8	7.30	7.30	7.30	7.30	7.30	7.30
HILL	8	7.40	7.60	7.60	7.60	7.60	7.60
HILL	8	7.60	7.60	7.60			
HILL	9	7.30	7.30	7.30	7.30	7.30	7.30
HILL	9	7.40	7.40	7.50	7.60	7.60	7.60
HILL	9	7.60	7.60	7.60	7.60	7.60	7.60
HILL	9	7.60	7.60	7.60			
HILL	10	7.30	7.30	7.30	7.40	7.50	7.50
HILL	10	7.60	7.60	7.60	7.60	7.60	7.60
HILL	10	7.60	7.60	7.60	7.60	7.60	7.60
HILL	10	7.60	7.60	7.60			
HILL	11	7.30	7.30	7.30	7.50	7.60	7.60
HILL	11	7.60	7.60	7.60	7.60	7.60	7.60
HILL	11	7.60	7.60	7.60	7.60	7.60	7.60
HILL	11	7.60	7.60	7.60			
HILL	12	7.30	7.40	7.60	7.60	7.60	7.60
HILL	12	7.60	7.60	7.60	7.60	7.60	7.60
HILL	12	7.60	7.60	7.60	7.60	7.60	7.60
HILL	12	7.60	7.60	7.60			
HILL	13	7.40	7.60	7.60	7.60	7.60	7.60
HILL	13	7.60	7.60	7.60	7.60	7.60	7.60
HILL	13	7.60	7.60	7.60	7.60	7.60	7.60
HILL	13	7.60	7.60	7.60			
HILL	14	7.60	7.60	7.60	7.60	7.60	7.60
HILL	14	7.60	7.60	7.60	7.60	7.60	7.60
HILL	14	7.60	7.60	7.60	7.60	7.60	7.60
HILL	14	7.60	7.60	7.60			
HILL	15	7.60	7.60	7.60	7.60	7.60	7.60
HILL	15	7.60	7.60	7.60	7.60	7.60	7.60
HILL	15	7.60	7.60	7.60	7.60	7.60	7.60
HILL	15	7.60	7.60	7.60			
HILL	16	7.60	7.60	7.60	7.60	7.60	7.60

```
                HILL    16      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    16      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    16      7.60    7.60    7.60
                HILL    17      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    17      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    17      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    17      7.60    7.60    7.60
                HILL    18      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    18      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    18      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    18      7.60    7.60    7.60
                HILL    19      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    19      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    19      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    19      7.60    7.60    7.60
                HILL    20      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    20      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    20      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    20      7.60    7.60    7.60
                HILL    21      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    21      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    21      7.60    7.60    7.60    7.60    7.60    7.60
                HILL    21      7.60    7.60    7.60
GRIDCART UCART1 END
GRIDCART UCART2 STA
                XYINC 633523.43 21 7.43 4263991.12 21 8.10
                ELEV    1       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    1       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    1       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    1       7.30    7.30    7.30
                ELEV    2       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    2       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    2       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    2       7.30    7.30    7.30
                ELEV    3       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    3       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    3       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    3       7.30    7.30    7.30
                ELEV    4       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    4       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    4       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    4       7.30    7.40    7.40
                ELEV    5       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    5       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    5       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    5       7.30    7.40    7.40
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                ELEV    6       7.30    7.30    7.30    7.30    7.30    7.30
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                ELEV    7       7.30    7.30    7.30    7.30    7.30    7.30
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                ELEV    7       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    7       7.30    7.40    7.50
                ELEV    8       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    8       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    8       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    8       7.30    7.40    7.50
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ELEV	9	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	9	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	9	7.30	7.40	7.50			
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ELEV	10	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	10	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	10	7.30	7.40	7.50			
ELEV	11	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	11	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	11	7.30	7.30	7.30	7.30	7.40	7.40
ELEV	11	7.40	7.50	7.50			
ELEV	12	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	12	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	12	7.30	7.30	7.30	7.40	7.40	7.40
ELEV	12	7.50	7.50	7.60			
ELEV	13	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	13	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	13	7.30	7.30	7.30	7.40	7.50	7.50
ELEV	13	7.60	7.60	7.60			
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.30	7.40	7.40	7.50	7.60
ELEV	14	7.60	7.60	7.60			
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ELEV	15	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	15	7.30	7.30	7.40	7.40	7.50	7.60
ELEV	15	7.60	7.60	7.60			
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ELEV	16	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	16	7.30	7.30	7.40	7.40	7.50	7.60
ELEV	16	7.60	7.60	7.60			
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ELEV	17	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	17	7.30	7.30	7.40	7.40	7.50	7.60
ELEV	17	7.60	7.60	7.60			
ELEV	18	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.30	7.40	7.40	7.50	7.60
ELEV	18	7.60	7.60	7.60			
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ELEV	19	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.40	7.40	7.50	7.60
ELEV	19	7.60	7.60	7.60			
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ELEV	20	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	20	7.30	7.30	7.40	7.40	7.50	7.60
ELEV	20	7.60	7.60	7.60			
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ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.40	7.40	7.50	7.60
ELEV	21	7.60	7.60	7.60			
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HILL	1	7.30	7.30	7.30	7.30	7.30	7.30
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HILL	1	7.30	7.30	7.30			
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HILL	5	7.30	7.40	7.40			
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HILL	7	7.30	7.40	7.50			
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HILL	8	7.30	7.30	7.30	7.30	7.30	7.30
HILL	8	7.30	7.40	7.50			
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HILL	10	7.30	7.30	7.30	7.30	7.30	7.30
HILL	10	7.30	7.40	7.50			
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HILL	11	7.30	7.30	7.30	7.30	7.30	7.30
HILL	11	7.30	7.30	7.30	7.30	7.40	7.40
HILL	11	7.40	7.50	7.50			
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HILL	12	7.30	7.30	7.30	7.30	7.30	7.30
HILL	12	7.30	7.30	7.30	7.40	7.40	7.40
HILL	12	7.50	7.50	7.60			
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HILL	14	7.60	7.60	7.60			
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HILL	15	7.30	7.30	7.40	7.40	7.50	7.60
HILL	15	7.60	7.60	7.60			
HILL	16	7.30	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.40	7.40	7.50	7.60
HILL	16	7.60	7.60	7.60			

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                HILL   17      7.60    7.60    7.60
                HILL   18      7.30    7.30    7.30    7.30    7.30    7.30
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                HILL   18      7.60    7.60    7.60
                HILL   19      7.30    7.30    7.30    7.30    7.30    7.30
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                HILL   19      7.60    7.60    7.60
                HILL   20      7.30    7.30    7.30    7.30    7.30    7.30
                HILL   20      7.30    7.30    7.30    7.30    7.30    7.30
                HILL   20      7.30    7.30    7.40    7.40    7.50    7.60
                HILL   20      7.60    7.60    7.60
                HILL   21      7.30    7.30    7.30    7.30    7.30    7.30
                HILL   21      7.30    7.30    7.30    7.30    7.30    7.30
                HILL   21      7.30    7.30    7.40    7.40    7.50    7.60
                HILL   21      7.60    7.60    7.60
GRIDCART UCART2 END
GRIDCART UCART3 STA
                XYINC 633592.05 21 3.89 4263774.69 21 10.72
                ELEV    1       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    1       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    1       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    1       7.00    7.00    7.00
                ELEV    2       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    2       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    2       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    2       7.00    7.00    7.00
                ELEV    3       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    3       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    3       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    3       7.00    7.00    7.00
                ELEV    4       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    4       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    4       7.00    7.00    7.00    7.00    7.00    7.00
                ELEV    4       7.00    7.10    7.10
                ELEV    5       7.00    7.00    7.00    7.00    7.00    7.00
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                ELEV    6       7.00    7.00    7.00    7.00    7.00    7.10
                ELEV    6       7.10    7.20    7.20
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                ELEV    7       7.20    7.20    7.20    7.20    7.20    7.20
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                ELEV    8       7.00    7.00    7.10    7.10    7.10    7.20
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                ELEV    8       7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    8       7.30    7.30    7.30
                ELEV    9       7.10    7.10    7.10    7.10    7.20    7.20
                ELEV    9       7.20    7.30    7.30    7.30    7.30    7.30
                ELEV    9       7.30    7.30    7.30    7.30    7.30    7.30
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ELEV	10	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	10	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	11	7.30	7.30	7.30			
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ELEV	11	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	11	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	12	7.30	7.30	7.30			
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ELEV	12	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	12	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	13	7.30	7.30	7.30			
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ELEV	13	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	13	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.30	7.30			
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	15	7.30	7.30	7.30			
ELEV	15	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	15	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	15	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	16	7.30	7.30	7.30			
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ELEV	16	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	16	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	17	7.30	7.30	7.30			
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ELEV	17	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	17	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.30	7.30			
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ELEV	18	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.30			
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ELEV	19	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	20	7.30	7.30	7.30			
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ELEV	20	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30			
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
HILL	1	7.00	7.00	7.00			
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HILL	2	7.00	7.00	7.00			
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HILL	3	7.00	7.00	7.00			
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HILL	3	7.00	7.00	7.00	7.00	7.00	7.00
HILL	3	7.00	7.00	7.00			
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HILL	4	7.00	7.10	7.10			
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HILL	11	7.30	7.30	7.30			
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HILL	13	7.30	7.30	7.30			
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HILL	14	7.30	7.30	7.30	7.30	7.30	7.30
HILL	14	7.30	7.30	7.30			
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HILL	15	7.30	7.30	7.30	7.30	7.30	7.30
HILL	15	7.30	7.30	7.30			
HILL	16	7.30	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.30			
HILL	17	7.30	7.30	7.30	7.30	7.30	7.30
HILL	17	7.30	7.30	7.30	7.30	7.30	7.30
HILL	17	7.30	7.30	7.30	7.30	7.30	7.30

```
                HILL    17      7.30    7.30    7.30
                HILL    18      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    18      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    18      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    18      7.30    7.30    7.30
                HILL    19      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    19      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    19      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    19      7.30    7.30    7.30
                HILL    20      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    20      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    20      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    20      7.30    7.30    7.30
                HILL    21      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    21      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    21      7.30    7.30    7.30    7.30    7.30    7.30
                HILL    21      7.30    7.30    7.30
GRIDCART UCART3 END
GRIDCART UCART5 STA
                XYINC 633535.32 21 2.84 4263888.16 21 5.36
                ELEV     1      7.10    7.10    7.10    7.10    7.20    7.20
                ELEV     1      7.20    7.20    7.30    7.30    7.30    7.30
                ELEV     1      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     1      7.30    7.30    7.30
                ELEV     2      7.10    7.10    7.10    7.20    7.20    7.20
                ELEV     2      7.20    7.30    7.30    7.30    7.30    7.30
                ELEV     2      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     2      7.30    7.30    7.30
                ELEV     3      7.20    7.20    7.20    7.20    7.20    7.20
                ELEV     3      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     3      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     3      7.30    7.30    7.30
                ELEV     4      7.20    7.20    7.20    7.20    7.30    7.30
                ELEV     4      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     4      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     4      7.30    7.30    7.30
                ELEV     5      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     5      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     5      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     5      7.30    7.30    7.30
                ELEV     6      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     6      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     6      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     6      7.30    7.30    7.30
                ELEV     7      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     7      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     7      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     7      7.30    7.30    7.30
                ELEV     8      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     8      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     8      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     8      7.30    7.30    7.30
                ELEV     9      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     9      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     9      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV     9      7.30    7.30    7.30
                ELEV    10      7.30    7.30    7.30    7.30    7.30    7.30
                ELEV    10      7.30    7.30    7.30    7.30    7.30    7.30
```

ELEV	10	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	10	7.30	7.30	7.30			
ELEV	11	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	11	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	11	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	11	7.30	7.30	7.30			
ELEV	12	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	12	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	12	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	12	7.30	7.30	7.30			
ELEV	13	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	13	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	13	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	13	7.30	7.30	7.30			
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.30	7.30			
ELEV	15	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	15	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	15	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	15	7.30	7.30	7.30			
ELEV	16	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	16	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	16	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	16	7.30	7.30	7.30			
ELEV	17	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	17	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	17	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	17	7.30	7.30	7.30			
ELEV	18	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.30	7.30			
ELEV	19	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.30			
ELEV	20	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	20	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	20	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	20	7.30	7.30	7.30			
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30			
HILL	1	7.10	7.10	7.10	7.10	7.20	7.20
HILL	1	7.20	7.20	7.30	7.30	7.30	7.30
HILL	1	7.30	7.30	7.30	7.30	7.30	7.30
HILL	1	7.30	7.30	7.30			
HILL	2	7.10	7.10	7.10	7.20	7.20	7.20
HILL	2	7.20	7.30	7.30	7.30	7.30	7.30
HILL	2	7.30	7.30	7.30	7.30	7.30	7.30
HILL	2	7.30	7.30	7.30			
HILL	3	7.20	7.20	7.20	7.20	7.20	7.20
HILL	3	7.30	7.30	7.30	7.30	7.30	7.30
HILL	3	7.30	7.30	7.30	7.30	7.30	7.30
HILL	3	7.30	7.30	7.30			

HILL	4	7.20	7.20	7.20	7.20	7.30	7.30
HILL	4	7.30	7.30	7.30	7.30	7.30	7.30
HILL	4	7.30	7.30	7.30	7.30	7.30	7.30
HILL	4	7.30	7.30	7.30			
HILL	5	7.30	7.30	7.30	7.30	7.30	7.30
HILL	5	7.30	7.30	7.30	7.30	7.30	7.30
HILL	5	7.30	7.30	7.30	7.30	7.30	7.30
HILL	5	7.30	7.30	7.30			
HILL	6	7.30	7.30	7.30	7.30	7.30	7.30
HILL	6	7.30	7.30	7.30	7.30	7.30	7.30
HILL	6	7.30	7.30	7.30	7.30	7.30	7.30
HILL	6	7.30	7.30	7.30			
HILL	7	7.30	7.30	7.30	7.30	7.30	7.30
HILL	7	7.30	7.30	7.30	7.30	7.30	7.30
HILL	7	7.30	7.30	7.30	7.30	7.30	7.30
HILL	7	7.30	7.30	7.30			
HILL	8	7.30	7.30	7.30	7.30	7.30	7.30
HILL	8	7.30	7.30	7.30	7.30	7.30	7.30
HILL	8	7.30	7.30	7.30	7.30	7.30	7.30
HILL	8	7.30	7.30	7.30			
HILL	9	7.30	7.30	7.30	7.30	7.30	7.30
HILL	9	7.30	7.30	7.30	7.30	7.30	7.30
HILL	9	7.30	7.30	7.30	7.30	7.30	7.30
HILL	9	7.30	7.30	7.30			
HILL	10	7.30	7.30	7.30	7.30	7.30	7.30
HILL	10	7.30	7.30	7.30	7.30	7.30	7.30
HILL	10	7.30	7.30	7.30	7.30	7.30	7.30
HILL	10	7.30	7.30	7.30			
HILL	11	7.30	7.30	7.30	7.30	7.30	7.30
HILL	11	7.30	7.30	7.30	7.30	7.30	7.30
HILL	11	7.30	7.30	7.30	7.30	7.30	7.30
HILL	11	7.30	7.30	7.30			
HILL	12	7.30	7.30	7.30	7.30	7.30	7.30
HILL	12	7.30	7.30	7.30	7.30	7.30	7.30
HILL	12	7.30	7.30	7.30	7.30	7.30	7.30
HILL	12	7.30	7.30	7.30			
HILL	13	7.30	7.30	7.30	7.30	7.30	7.30
HILL	13	7.30	7.30	7.30	7.30	7.30	7.30
HILL	13	7.30	7.30	7.30	7.30	7.30	7.30
HILL	13	7.30	7.30	7.30			
HILL	14	7.30	7.30	7.30	7.30	7.30	7.30
HILL	14	7.30	7.30	7.30	7.30	7.30	7.30
HILL	14	7.30	7.30	7.30	7.30	7.30	7.30
HILL	14	7.30	7.30	7.30			
HILL	15	7.30	7.30	7.30	7.30	7.30	7.30
HILL	15	7.30	7.30	7.30	7.30	7.30	7.30
HILL	15	7.30	7.30	7.30	7.30	7.30	7.30
HILL	15	7.30	7.30	7.30			
HILL	16	7.30	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.30			
HILL	17	7.30	7.30	7.30	7.30	7.30	7.30
HILL	17	7.30	7.30	7.30	7.30	7.30	7.30
HILL	17	7.30	7.30	7.30	7.30	7.30	7.30
HILL	17	7.30	7.30	7.30			
HILL	18	7.30	7.30	7.30	7.30	7.30	7.30
HILL	18	7.30	7.30	7.30	7.30	7.30	7.30

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                HILL   18      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   18      7.30      7.30      7.30
                HILL   19      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   19      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   19      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   19      7.30      7.30      7.30
                HILL   20      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   20      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   20      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   20      7.30      7.30      7.30
                HILL   21      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   21      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   21      7.30      7.30      7.30      7.30      7.30      7.30
                HILL   21      7.30      7.30      7.30
GRIDCART UCART5 END
GRIDCART UCART4 STA
                XYINC 632255.90 21 18.87 4263542.95 21 23.16
                ELEV    1      6.00      6.00      5.90      5.80      5.80      5.80
                ELEV    1      5.80      5.80      5.80      5.80      5.80      5.80
                ELEV    1      5.80      5.80      5.80      5.80      5.80      5.80
                ELEV    1      5.80      5.80      5.80
                ELEV    2      6.10      6.10      6.00      5.90      5.90      5.90
                ELEV    2      5.90      5.90      5.90      5.90      5.90      5.90
                ELEV    2      5.90      5.80      5.80      5.80      5.80      5.80
                ELEV    2      5.80      5.80      5.80
                ELEV    3      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    3      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    3      6.10      5.90      5.80      5.80      5.80      5.80
                ELEV    3      5.80      5.80      5.80
                ELEV    4      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    4      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    4      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    4      6.10      6.00      5.80
                ELEV    5      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    5      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    5      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    5      6.10      6.10      6.00
                ELEV    6      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    6      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    6      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    6      6.10      6.10      6.10
                ELEV    7      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    7      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    7      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    7      6.10      6.10      6.10
                ELEV    8      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    8      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    8      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    8      6.10      6.10      6.10
                ELEV    9      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    9      6.10      6.10      6.10      6.10      6.10      6.10
                ELEV    9      6.10      6.10      6.10      6.10      6.20      6.30
                ELEV    9      6.30      6.30      6.30
                ELEV   10      6.10      6.10      6.10      6.10      6.10      6.20
                ELEV   10      6.30      6.30      6.30      6.30      6.10      6.10
                ELEV   10      6.30      6.30      6.30      6.30      6.30      6.40
                ELEV   10      6.40      6.40      6.40
                ELEV   11      6.10      6.10      6.10      6.10      6.20      6.30
```

ELEV	11	6.40	6.40	6.40	6.40	6.30	6.30
ELEV	11	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	11	6.40	6.40	6.40			
ELEV	12	6.10	6.10	6.10	6.20	6.40	6.40
ELEV	12	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	12	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	12	6.40	6.40	6.40			
ELEV	13	6.10	6.10	6.10	6.20	6.40	6.40
ELEV	13	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	13	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	13	6.40	6.50	6.70			
ELEV	14	6.10	6.10	6.20	6.30	6.40	6.40
ELEV	14	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	14	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	14	6.50	6.60	6.70			
ELEV	15	6.10	6.10	6.30	6.40	6.40	6.40
ELEV	15	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	15	6.50	6.50	6.50	6.50	6.50	6.50
ELEV	15	6.70	6.70	6.70			
ELEV	16	6.10	6.20	6.30	6.40	6.40	6.40
ELEV	16	6.40	6.40	6.40	6.40	6.40	6.50
ELEV	16	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	16	6.70	6.70	6.80			
ELEV	17	6.20	6.40	6.40	6.40	6.40	6.40
ELEV	17	6.40	6.40	6.40	6.40	6.60	6.70
ELEV	17	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	17	6.70	6.80	7.00			
ELEV	18	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	18	6.40	6.40	6.50	6.60	6.70	6.70
ELEV	18	6.70	6.70	6.70	6.70	6.70	6.70
ELEV	18	6.90	7.00	7.00			
ELEV	19	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	19	6.40	6.40	6.50	6.70	6.70	6.70
ELEV	19	6.70	6.70	6.70	6.70	6.80	6.90
ELEV	19	7.00	7.00	7.00			
ELEV	20	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	20	6.40	6.40	6.50	6.70	6.70	6.70
ELEV	20	6.70	6.70	6.70	6.70	6.80	7.00
ELEV	20	7.00	7.00	7.00			
ELEV	21	6.40	6.40	6.40	6.40	6.40	6.40
ELEV	21	6.40	6.40	6.50	6.70	6.70	6.70
ELEV	21	6.70	6.70	6.70	6.70	6.80	7.00
ELEV	21	7.00	7.00	7.00			
HILL	1	6.00	6.00	5.90	5.80	5.80	5.80
HILL	1	5.80	5.80	5.80	5.80	5.80	5.80
HILL	1	5.80	5.80	5.80	5.80	5.80	5.80
HILL	1	5.80	5.80	5.80			
HILL	2	6.10	6.10	6.00	5.90	5.90	5.90
HILL	2	5.90	5.90	5.90	5.90	5.90	5.90
HILL	2	5.90	5.80	5.80	5.80	5.80	5.80
HILL	2	5.80	5.80	5.80			
HILL	3	6.10	6.10	6.10	6.10	6.10	6.10
HILL	3	6.10	6.10	6.10	6.10	6.10	6.10
HILL	3	6.10	5.90	5.80	5.80	5.80	5.80
HILL	3	5.80	5.80	5.80			
HILL	4	6.10	6.10	6.10	6.10	6.10	6.10
HILL	4	6.10	6.10	6.10	6.10	6.10	6.10
HILL	4	6.10	6.10	6.10	6.10	6.10	6.10

HILL	4	6.10	6.00	5.80			
HILL	5	6.10	6.10	6.10	6.10	6.10	6.10
HILL	5	6.10	6.10	6.10	6.10	6.10	6.10
HILL	5	6.10	6.10	6.10	6.10	6.10	6.10
HILL	5	6.10	6.10	6.00			
HILL	6	6.10	6.10	6.10	6.10	6.10	6.10
HILL	6	6.10	6.10	6.10	6.10	6.10	6.10
HILL	6	6.10	6.10	6.10	6.10	6.10	6.10
HILL	6	6.10	6.10	6.10			
HILL	7	6.10	6.10	6.10	6.10	6.10	6.10
HILL	7	6.10	6.10	6.10	6.10	6.10	6.10
HILL	7	6.10	6.10	6.10	6.10	6.10	6.10
HILL	7	6.10	6.10	6.10			
HILL	8	6.10	6.10	6.10	6.10	6.10	6.10
HILL	8	6.10	6.10	6.10	6.10	6.10	6.10
HILL	8	6.10	6.10	6.10	6.10	6.10	6.10
HILL	8	6.10	6.10	6.10			
HILL	9	6.10	6.10	6.10	6.10	6.10	6.10
HILL	9	6.10	6.10	6.10	6.10	6.10	6.10
HILL	9	6.10	6.10	6.10	6.10	6.20	6.30
HILL	9	6.30	6.30	6.30			
HILL	10	6.10	6.10	6.10	6.10	6.10	6.20
HILL	10	6.30	6.30	6.30	6.30	6.10	6.10
HILL	10	6.30	6.30	6.30	6.30	6.30	6.40
HILL	10	6.40	6.40	6.40			
HILL	11	6.10	6.10	6.10	6.10	6.20	6.30
HILL	11	6.40	6.40	6.40	6.40	6.30	6.30
HILL	11	6.40	6.40	6.40	6.40	6.40	6.40
HILL	11	6.40	6.40	6.40			
HILL	12	6.10	6.10	6.10	6.20	6.40	6.40
HILL	12	6.40	6.40	6.40	6.40	6.40	6.40
HILL	12	6.40	6.40	6.40	6.40	6.40	6.40
HILL	12	6.40	6.40	6.40			
HILL	13	6.10	6.10	6.10	6.20	6.40	6.40
HILL	13	6.40	6.40	6.40	6.40	6.40	6.40
HILL	13	6.40	6.40	6.40	6.40	6.40	6.40
HILL	13	6.40	6.50	6.70			
HILL	14	6.10	6.10	6.20	6.30	6.40	6.40
HILL	14	6.40	6.40	6.40	6.40	6.40	6.40
HILL	14	6.40	6.40	6.40	6.40	6.40	6.40
HILL	14	6.50	6.60	6.70			
HILL	15	6.10	6.10	6.30	6.40	6.40	6.40
HILL	15	6.40	6.40	6.40	6.40	6.40	6.40
HILL	15	6.50	6.50	6.50	6.50	6.50	6.50
HILL	15	6.70	6.70	6.70			
HILL	16	6.10	6.20	6.30	6.40	6.40	6.40
HILL	16	6.40	6.40	6.40	6.40	6.40	6.50
HILL	16	6.70	6.70	6.70	6.70	6.70	6.70
HILL	16	6.70	6.70	6.80			
HILL	17	6.20	6.40	6.40	6.40	6.40	6.40
HILL	17	6.40	6.40	6.40	6.40	6.60	6.70
HILL	17	6.70	6.70	6.70	6.70	6.70	6.70
HILL	17	6.70	6.80	7.00			
HILL	18	6.40	6.40	6.40	6.40	6.40	6.40
HILL	18	6.40	6.40	6.50	6.60	6.70	6.70
HILL	18	6.70	6.70	6.70	6.70	6.70	6.70
HILL	18	6.90	7.00	7.00			
HILL	19	6.40	6.40	6.40	6.40	6.40	6.40

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                HILL    19      6.40    6.40    6.50    6.70    6.70    6.70
                HILL    19      6.70    6.70    6.70    6.70    6.80    6.90
                HILL    19      7.00    7.00    7.00
                HILL    20      6.40    6.40    6.40    6.40    6.40    6.40
                HILL    20      6.40    6.40    6.50    6.70    6.70    6.70
                HILL    20      6.70    6.70    6.70    6.70    6.80    7.00
                HILL    20      7.00    7.00    7.00
                HILL    21      6.40    6.40    6.40    6.40    6.40    6.40
                HILL    21      6.40    6.40    6.50    6.70    6.70    6.70
                HILL    21      6.70    6.70    6.70    6.70    6.80    7.00
                HILL    21      7.00    7.00    7.00
GRIDCART UCART4 END
GRIDCART UCART6 STA
                XYINC 632270.09 21 32.64 4262957.76 21 27.79
                ELEV    1       4.60    4.60    4.60    4.90    4.90    4.90
                ELEV    1       4.90    5.00    5.20    5.20    5.20    5.20
                ELEV    1       5.50    5.50    5.50    5.50    5.50    5.50
                ELEV    1       5.60    5.80    5.80
                ELEV    2       4.60    4.60    4.90    4.90    4.90    4.90
                ELEV    2       5.00    5.20    5.20    5.20    5.20    5.40
                ELEV    2       5.50    5.50    5.50    5.50    5.50    5.60
                ELEV    2       5.80    5.80    5.80
                ELEV    3       4.60    4.60    4.90    4.90    4.90    4.90
                ELEV    3       5.00    5.20    5.20    5.20    5.20    5.40
                ELEV    3       5.50    5.50    5.50    5.50    5.60    5.80
                ELEV    3       5.80    5.80    5.80
                ELEV    4       4.60    4.60    4.90    4.90    4.90    4.90
                ELEV    4       5.00    5.20    5.20    5.20    5.40    5.50
                ELEV    4       5.50    5.50    5.50    5.50    5.60    5.80
                ELEV    4       5.80    5.80    5.80
                ELEV    5       4.60    4.60    4.90    4.90    4.90    5.00
                ELEV    5       5.10    5.20    5.20    5.20    5.40    5.50
                ELEV    5       5.50    5.50    5.50    5.50    5.70    5.80
                ELEV    5       5.80    5.80    5.80
                ELEV    6       4.60    4.60    4.90    4.90    4.90    5.00
                ELEV    6       5.20    5.20    5.20    5.20    5.40    5.50
                ELEV    6       5.50    5.50    5.50    5.50    5.80    5.80
                ELEV    6       5.80    5.80    5.80
                ELEV    7       4.60    4.60    4.90    4.90    4.90    5.10
                ELEV    7       5.20    5.20    5.20    5.30    5.50    5.50
                ELEV    7       5.50    5.50    5.50    5.70    5.80    5.80
                ELEV    7       5.80    5.80    5.80
                ELEV    8       4.60    4.70    4.90    4.90    5.10    5.20
                ELEV    8       5.20    5.20    5.20    5.40    5.50    5.50
                ELEV    8       5.50    5.50    5.50    5.80    5.80    5.80
                ELEV    8       5.80    5.80    5.80
                ELEV    9       4.70    4.90    4.90    5.10    5.20    5.20
                ELEV    9       5.20    5.20    5.30    5.40    5.50    5.50
                ELEV    9       5.50    5.50    5.70    5.80    5.80    5.80
                ELEV    9       5.80    5.80    5.90
                ELEV   10       4.90    4.90    5.00    5.20    5.20    5.20
                ELEV   10       5.20    5.20    5.40    5.50    5.50    5.50
                ELEV   10       5.50    5.50    5.80    5.80    5.80    5.80
                ELEV   10       5.80    5.80    6.00
                ELEV   11       4.90    5.00    5.20    5.20    5.20    5.20
                ELEV   11       5.20    5.20    5.40    5.50    5.50    5.50
                ELEV   11       5.50    5.50    5.80    5.80    5.80    5.80
                ELEV   11       5.80    5.80    6.00
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ELEV	12	5.00	5.20	5.20	5.20	5.20	5.20
ELEV	12	5.20	5.40	5.50	5.50	5.50	5.50
ELEV	12	5.50	5.60	5.80	5.80	5.80	5.80
ELEV	12	5.80	5.80	6.00			
ELEV	13	5.20	5.20	5.20	5.20	5.20	5.20
ELEV	13	5.30	5.50	5.50	5.50	5.50	5.50
ELEV	13	5.50	5.80	5.80	5.80	5.80	5.80
ELEV	13	5.80	6.00	6.10			
ELEV	14	5.20	5.20	5.20	5.20	5.20	5.20
ELEV	14	5.30	5.50	5.50	5.50	5.50	5.50
ELEV	14	5.50	5.80	5.80	5.80	5.80	5.80
ELEV	14	5.80	6.00	6.10			
ELEV	15	5.20	5.20	5.20	5.50	5.50	5.50
ELEV	15	5.50	5.50	5.50	5.50	5.50	5.50
ELEV	15	5.50	5.80	5.80	5.80	5.80	5.80
ELEV	15	5.90	6.10	6.10			
ELEV	16	5.50	5.50	5.50	5.50	5.50	5.50
ELEV	16	5.50	5.50	5.50	5.50	5.50	5.50
ELEV	16	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	16	5.90	6.10	6.10			
ELEV	17	5.50	5.50	5.50	5.50	5.50	5.50
ELEV	17	5.50	5.50	5.50	5.50	5.50	5.50
ELEV	17	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	17	5.90	6.10	6.10			
ELEV	18	5.50	5.50	5.50	5.50	5.50	5.50
ELEV	18	5.50	5.50	5.50	5.50	5.50	5.70
ELEV	18	5.80	5.80	5.80	5.80	5.80	5.90
ELEV	18	6.10	6.10	6.10			
ELEV	19	5.70	5.70	5.70	5.70	5.70	5.70
ELEV	19	5.60	5.50	5.50	5.50	5.70	5.80
ELEV	19	5.80	5.80	5.80	5.80	5.90	6.10
ELEV	19	6.10	6.10	6.10			
ELEV	20	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	20	5.80	5.70	5.70	5.70	5.80	5.80
ELEV	20	5.80	5.80	5.80	5.80	6.00	6.10
ELEV	20	6.10	6.10	6.10			
ELEV	21	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	21	5.80	5.80	5.80	5.80	5.80	5.80
ELEV	21	5.80	5.80	5.80	5.90	6.10	6.10
ELEV	21	6.10	6.10	6.10			
HILL	1	4.60	4.60	4.60	4.90	4.90	4.90
HILL	1	4.90	5.00	5.20	5.20	5.20	5.20
HILL	1	5.50	5.50	5.50	5.50	5.50	5.50
HILL	1	5.60	5.80	5.80			
HILL	2	4.60	4.60	4.90	4.90	4.90	4.90
HILL	2	5.00	5.20	5.20	5.20	5.20	5.40
HILL	2	5.50	5.50	5.50	5.50	5.50	5.60
HILL	2	5.80	5.80	5.80			
HILL	3	4.60	4.60	4.90	4.90	4.90	4.90
HILL	3	5.00	5.20	5.20	5.20	5.20	5.40
HILL	3	5.50	5.50	5.50	5.50	5.60	5.80
HILL	3	5.80	5.80	5.80			
HILL	4	4.60	4.60	4.90	4.90	4.90	4.90
HILL	4	5.00	5.20	5.20	5.20	5.40	5.50
HILL	4	5.50	5.50	5.50	5.50	5.60	5.80
HILL	4	5.80	5.80	5.80			
HILL	5	4.60	4.60	4.90	4.90	4.90	5.00
HILL	5	5.10	5.20	5.20	5.20	5.40	5.50

HILL	5	5.50	5.50	5.50	5.50	5.70	5.80
HILL	5	5.80	5.80	5.80			
HILL	6	4.60	4.60	4.90	4.90	4.90	5.00
HILL	6	5.20	5.20	5.20	5.20	5.40	5.50
HILL	6	5.50	5.50	5.50	5.50	5.80	5.80
HILL	6	5.80	5.80	5.80			
HILL	7	4.60	4.60	4.90	4.90	4.90	5.10
HILL	7	5.20	5.20	5.20	5.30	5.50	5.50
HILL	7	5.50	5.50	5.50	5.70	5.80	5.80
HILL	7	5.80	5.80	5.80			
HILL	8	4.60	4.70	4.90	4.90	5.10	5.20
HILL	8	5.20	5.20	5.20	5.40	5.50	5.50
HILL	8	5.50	5.50	5.50	5.80	5.80	5.80
HILL	8	5.80	5.80	5.80			
HILL	9	4.70	4.90	4.90	5.10	5.20	5.20
HILL	9	5.20	5.20	5.30	5.40	5.50	5.50
HILL	9	5.50	5.50	5.70	5.80	5.80	5.80
HILL	9	5.80	5.80	5.90			
HILL	10	4.90	4.90	5.00	5.20	5.20	5.20
HILL	10	5.20	5.20	5.40	5.50	5.50	5.50
HILL	10	5.50	5.50	5.80	5.80	5.80	5.80
HILL	10	5.80	5.80	6.00			
HILL	11	4.90	5.00	5.20	5.20	5.20	5.20
HILL	11	5.20	5.20	5.40	5.50	5.50	5.50
HILL	11	5.50	5.50	5.80	5.80	5.80	5.80
HILL	11	5.80	5.80	6.00			
HILL	12	5.00	5.20	5.20	5.20	5.20	5.20
HILL	12	5.20	5.40	5.50	5.50	5.50	5.50
HILL	12	5.50	5.60	5.80	5.80	5.80	5.80
HILL	12	5.80	5.80	6.00			
HILL	13	5.20	5.20	5.20	5.20	5.20	5.20
HILL	13	5.30	5.50	5.50	5.50	5.50	5.50
HILL	13	5.50	5.80	5.80	5.80	5.80	5.80
HILL	13	5.80	6.00	6.10			
HILL	14	5.20	5.20	5.20	5.20	5.20	5.20
HILL	14	5.30	5.50	5.50	5.50	5.50	5.50
HILL	14	5.50	5.80	5.80	5.80	5.80	5.80
HILL	14	5.80	6.00	6.10			
HILL	15	5.20	5.20	5.20	5.50	5.50	5.50
HILL	15	5.50	5.50	5.50	5.50	5.50	5.50
HILL	15	5.50	5.80	5.80	5.80	5.80	5.80
HILL	15	5.90	6.10	6.10			
HILL	16	5.50	5.50	5.50	5.50	5.50	5.50
HILL	16	5.50	5.50	5.50	5.50	5.50	5.50
HILL	16	5.80	5.80	5.80	5.80	5.80	5.80
HILL	16	5.90	6.10	6.10			
HILL	17	5.50	5.50	5.50	5.50	5.50	5.50
HILL	17	5.50	5.50	5.50	5.50	5.50	5.50
HILL	17	5.80	5.80	5.80	5.80	5.80	5.80
HILL	17	5.90	6.10	6.10			
HILL	18	5.50	5.50	5.50	5.50	5.50	5.50
HILL	18	5.50	5.50	5.50	5.50	5.50	5.70
HILL	18	5.80	5.80	5.80	5.80	5.80	5.90
HILL	18	6.10	6.10	6.10			
HILL	19	5.70	5.70	5.70	5.70	5.70	5.70
HILL	19	5.60	5.50	5.50	5.50	5.70	5.80
HILL	19	5.80	5.80	5.80	5.80	5.90	6.10
HILL	19	6.10	6.10	6.10			

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                HILL    20      5.80    5.80    5.80    5.80    5.80    5.80
                HILL    20      5.80    5.70    5.70    5.70    5.80    5.80
                HILL    20      5.80    5.80    5.80    5.80    6.00    6.10
                HILL    20      6.10    6.10    6.10
                HILL    21      5.80    5.80    5.80    5.80    5.80    5.80
                HILL    21      5.80    5.80    5.80    5.80    5.80    5.80
                HILL    21      5.80    5.80    5.80    5.90    6.10    6.10
                HILL    21      6.10    6.10    6.10
GRIDCART UCART6 END
GRIDCART UCART7 STA
                XYINC 631968.65 21 70.54 4264377.17 21 39.56
                ELEV    1       6.40    6.40    6.40    6.20    6.10    6.10
                ELEV    1       6.10    6.20    6.30    6.50    7.40    7.60
                ELEV    1       7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    1       7.30    7.30    7.30
                ELEV    2       6.40    6.40    6.40    6.40    6.30    6.30
                ELEV    2       6.30    6.40    6.50    6.90    7.60    7.60
                ELEV    2       7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    2       7.30    7.30    7.30
                ELEV    3       6.30    6.40    6.40    6.40    6.40    6.40
                ELEV    3       6.40    6.70    6.70    7.30    7.60    7.60
                ELEV    3       7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    3       7.30    7.50    7.60
                ELEV    4       6.30    6.40    6.40    6.40    6.50    6.60
                ELEV    4       6.70    6.70    6.90    7.30    7.60    7.60
                ELEV    4       7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    4       7.30    7.50    7.60
                ELEV    5       6.10    6.40    6.40    6.40    6.70    6.70
                ELEV    5       6.70    6.90    7.00    7.30    7.60    7.60
                ELEV    5       7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    5       7.30    7.60    7.60
                ELEV    6       6.10    6.40    6.40    6.40    6.70    6.70
                ELEV    6       6.70    7.00    7.20    7.60    7.60    7.60
                ELEV    6       7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    6       7.40    7.60    7.60
                ELEV    7       6.10    6.30    6.40    6.40    6.70    6.70
                ELEV    7       7.00    7.00    7.30    7.60    7.60    7.60
                ELEV    7       7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    7       7.40    7.60    7.60
                ELEV    8       6.10    6.10    6.30    6.40    6.70    6.70
                ELEV    8       7.00    7.10    7.30    7.60    7.60    7.60
                ELEV    8       7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    8       7.50    7.60    7.60
                ELEV    9       6.10    6.10    6.10    6.40    6.70    6.90
                ELEV    9       7.00    7.10    7.30    7.60    7.60    7.60
                ELEV    9       7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    9       7.60    7.60    7.60
                ELEV    10      6.10    6.10    6.10    6.40    6.70    6.90
                ELEV    10      7.00    7.30    7.40    7.60    7.60    7.60
                ELEV    10      7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    10      7.60    7.60    7.60
                ELEV    11      6.10    6.10    6.20    6.40    6.70    7.00
                ELEV    11      7.00    7.30    7.50    7.60    7.60    7.60
                ELEV    11      7.60    7.30    7.30    7.30    7.30    7.30
                ELEV    11      7.60    7.60    7.60
                ELEV    12      6.10    6.10    6.40    6.60    6.70    7.00
                ELEV    12      7.00    7.30    7.60    7.60    7.60    7.60
                ELEV    12      7.60    7.30    7.30    7.30    7.30    7.30
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ELEV	12	7.60	7.60	7.60			
ELEV	13	6.20	6.40	6.40	6.70	6.70	7.00
ELEV	13	7.30	7.30	7.60	7.60	7.60	7.60
ELEV	13	7.60	7.50	7.30	7.30	7.30	7.30
ELEV	13	7.60	7.60	7.60			
ELEV	14	6.40	6.40	6.50	6.70	6.80	7.00
ELEV	14	7.30	7.30	7.60	7.60	7.60	7.60
ELEV	14	7.60	7.50	7.30	7.30	7.30	7.30
ELEV	14	7.60	7.60	7.60			
ELEV	15	6.40	6.40	6.70	6.70	7.00	7.00
ELEV	15	7.30	7.40	7.60	7.60	7.60	7.60
ELEV	15	7.60	7.50	7.30	7.30	7.30	7.50
ELEV	15	7.60	7.60	7.60			
ELEV	16	6.40	6.50	6.70	6.70	7.00	7.00
ELEV	16	7.30	7.40	7.60	7.60	7.60	7.60
ELEV	16	7.60	7.50	7.30	7.30	7.30	7.60
ELEV	16	7.60	7.60	7.60			
ELEV	17	6.40	6.70	6.70	6.80	7.00	7.00
ELEV	17	7.30	7.40	7.60	7.60	7.60	7.60
ELEV	17	7.60	7.50	7.30	7.30	7.30	7.60
ELEV	17	7.60	7.60	7.60			
ELEV	18	6.40	6.70	6.70	7.00	7.00	7.00
ELEV	18	7.30	7.40	7.60	7.60	7.60	7.60
ELEV	18	7.60	7.50	7.30	7.30	7.30	7.60
ELEV	18	7.60	7.60	7.60			
ELEV	19	6.40	6.70	6.70	7.00	7.00	7.20
ELEV	19	7.30	7.60	7.60	7.60	7.60	7.60
ELEV	19	7.60	7.50	7.30	7.30	7.30	7.60
ELEV	19	7.60	7.60	7.60			
ELEV	20	6.70	6.70	6.70	7.00	7.00	7.20
ELEV	20	7.30	7.60	7.60	7.60	7.60	7.60
ELEV	20	7.60	7.50	7.30	7.30	7.30	7.60
ELEV	20	7.60	7.60	7.60			
ELEV	21	6.70	6.70	6.80	7.00	7.00	7.30
ELEV	21	7.30	7.60	7.60	7.60	7.60	7.60
ELEV	21	7.60	7.50	7.30	7.30	7.30	7.60
ELEV	21	7.60	7.60	7.60			
HILL	1	6.40	6.40	6.40	6.20	6.10	6.10
HILL	1	6.10	6.20	6.30	6.50	7.40	7.60
HILL	1	7.60	7.30	7.30	7.30	7.30	7.30
HILL	1	7.30	7.30	7.30			
HILL	2	6.40	6.40	6.40	6.40	6.30	6.30
HILL	2	6.30	6.40	6.50	6.90	7.60	7.60
HILL	2	7.60	7.30	7.30	7.30	7.30	7.30
HILL	2	7.30	7.30	7.30			
HILL	3	6.30	6.40	6.40	6.40	6.40	6.40
HILL	3	6.40	6.70	6.70	7.30	7.60	7.60
HILL	3	7.60	7.30	7.30	7.30	7.30	7.30
HILL	3	7.30	7.50	7.60			
HILL	4	6.30	6.40	6.40	6.40	6.50	6.60
HILL	4	6.70	6.70	6.90	7.30	7.60	7.60
HILL	4	7.60	7.30	7.30	7.30	7.30	7.30
HILL	4	7.30	7.50	7.60			
HILL	5	6.10	6.40	6.40	6.40	6.70	6.70
HILL	5	6.70	6.90	7.00	7.30	7.60	7.60
HILL	5	7.60	7.30	7.30	7.30	7.30	7.30
HILL	5	7.30	7.60	7.60			
HILL	6	6.10	6.40	6.40	6.40	6.70	6.70

HILL	6	6.70	7.00	7.20	7.60	7.60	7.60
HILL	6	7.60	7.30	7.30	7.30	7.30	7.30
HILL	6	7.40	7.60	7.60			
HILL	7	6.10	6.30	6.40	6.40	6.70	6.70
HILL	7	7.00	7.00	7.30	7.60	7.60	7.60
HILL	7	7.60	7.30	7.30	7.30	7.30	7.30
HILL	7	7.40	7.60	7.60			
HILL	8	6.10	6.10	6.30	6.40	6.70	6.70
HILL	8	7.00	7.10	7.30	7.60	7.60	7.60
HILL	8	7.60	7.30	7.30	7.30	7.30	7.30
HILL	8	7.50	7.60	7.60			
HILL	9	6.10	6.10	6.10	6.40	6.70	6.90
HILL	9	7.00	7.10	7.30	7.60	7.60	7.60
HILL	9	7.60	7.30	7.30	7.30	7.30	7.30
HILL	9	7.60	7.60	7.60			
HILL	10	6.10	6.10	6.10	6.40	6.70	6.90
HILL	10	7.00	7.30	7.40	7.60	7.60	7.60
HILL	10	7.60	7.30	7.30	7.30	7.30	7.30
HILL	10	7.60	7.60	7.60			
HILL	11	6.10	6.10	6.20	6.40	6.70	7.00
HILL	11	7.00	7.30	7.50	7.60	7.60	7.60
HILL	11	7.60	7.30	7.30	7.30	7.30	7.30
HILL	11	7.60	7.60	7.60			
HILL	12	6.10	6.10	6.40	6.60	6.70	7.00
HILL	12	7.00	7.30	7.60	7.60	7.60	7.60
HILL	12	7.60	7.30	7.30	7.30	7.30	7.30
HILL	12	7.60	7.60	7.60			
HILL	13	6.20	6.40	6.40	6.70	6.70	7.00
HILL	13	7.30	7.30	7.60	7.60	7.60	7.60
HILL	13	7.60	7.50	7.30	7.30	7.30	7.30
HILL	13	7.60	7.60	7.60			
HILL	14	6.40	6.40	6.50	6.70	6.80	7.00
HILL	14	7.30	7.30	7.60	7.60	7.60	7.60
HILL	14	7.60	7.50	7.30	7.30	7.30	7.30
HILL	14	7.60	7.60	7.60			
HILL	15	6.40	6.40	6.70	6.70	7.00	7.00
HILL	15	7.30	7.40	7.60	7.60	7.60	7.60
HILL	15	7.60	7.50	7.30	7.30	7.30	7.50
HILL	15	7.60	7.60	7.60			
HILL	16	6.40	6.50	6.70	6.70	7.00	7.00
HILL	16	7.30	7.40	7.60	7.60	7.60	7.60
HILL	16	7.60	7.50	7.30	7.30	7.30	7.60
HILL	16	7.60	7.60	7.60			
HILL	17	6.40	6.70	6.70	6.80	7.00	7.00
HILL	17	7.30	7.40	7.60	7.60	7.60	7.60
HILL	17	7.60	7.50	7.30	7.30	7.30	7.60
HILL	17	7.60	7.60	7.60			
HILL	18	6.40	6.70	6.70	7.00	7.00	7.00
HILL	18	7.30	7.40	7.60	7.60	7.60	7.60
HILL	18	7.60	7.50	7.30	7.30	7.30	7.60
HILL	18	7.60	7.60	7.60			
HILL	19	6.40	6.70	6.70	7.00	7.00	7.20
HILL	19	7.30	7.60	7.60	7.60	7.60	7.60
HILL	19	7.60	7.50	7.30	7.30	7.30	7.60
HILL	19	7.60	7.60	7.60			
HILL	20	6.70	6.70	6.70	7.00	7.00	7.20
HILL	20	7.30	7.60	7.60	7.60	7.60	7.60
HILL	20	7.60	7.50	7.30	7.30	7.30	7.60

```
                HILL   20     7.60     7.60     7.60
                HILL   21     6.70     6.70     6.80     7.00     7.00     7.30
                HILL   21     7.30     7.60     7.60     7.60     7.60     7.60
                HILL   21     7.60     7.50     7.30     7.30     7.30     7.60
                HILL   21     7.60     7.60     7.60
GRIDCART UCART7 END
GRIDCART UCART8 STA
                XYINC 633528.10 21 6.79 4264154.56 21 10.52
                ELEV    1     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    1     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    1     7.30     7.30     7.30     7.40     7.40     7.50
                ELEV    1     7.60     7.60     7.60
                ELEV    2     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    2     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    2     7.30     7.30     7.30     7.40     7.40     7.50
                ELEV    2     7.60     7.60     7.60
                ELEV    3     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    3     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    3     7.30     7.30     7.30     7.40     7.40     7.50
                ELEV    3     7.60     7.60     7.60
                ELEV    4     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    4     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    4     7.30     7.30     7.30     7.40     7.50     7.50
                ELEV    4     7.60     7.60     7.60
                ELEV    5     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    5     7.30     7.30     7.30     7.30     7.30     7.40
                ELEV    5     7.40     7.40     7.40     7.50     7.50     7.60
                ELEV    5     7.60     7.60     7.60
                ELEV    6     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    6     7.30     7.30     7.30     7.30     7.30     7.40
                ELEV    6     7.40     7.50     7.50     7.60     7.60     7.60
                ELEV    6     7.60     7.60     7.60
                ELEV    7     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    7     7.30     7.30     7.30     7.30     7.30     7.40
                ELEV    7     7.50     7.50     7.60     7.60     7.60     7.60
                ELEV    7     7.60     7.60     7.60
                ELEV    8     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    8     7.30     7.30     7.30     7.30     7.30     7.40
                ELEV    8     7.50     7.50     7.60     7.60     7.60     7.60
                ELEV    8     7.60     7.60     7.60
                ELEV    9     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV    9     7.30     7.30     7.30     7.30     7.30     7.40
                ELEV    9     7.50     7.50     7.60     7.60     7.60     7.60
                ELEV    9     7.60     7.60     7.60
                ELEV   10     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV   10     7.30     7.30     7.30     7.30     7.30     7.40
                ELEV   10     7.50     7.50     7.60     7.60     7.60     7.60
                ELEV   10     7.60     7.60     7.60
                ELEV   11     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV   11     7.30     7.30     7.30     7.30     7.30     7.40
                ELEV   11     7.50     7.50     7.60     7.60     7.60     7.60
                ELEV   11     7.60     7.60     7.60
                ELEV   12     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV   12     7.30     7.30     7.30     7.30     7.30     7.40
                ELEV   12     7.50     7.50     7.60     7.60     7.60     7.60
                ELEV   12     7.60     7.60     7.60
                ELEV   13     7.30     7.30     7.30     7.30     7.30     7.30
                ELEV   13     7.30     7.30     7.30     7.30     7.30     7.40
```

ELEV	13	7.50	7.50	7.60	7.60	7.60	7.60
ELEV	13	7.60	7.60	7.60			
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	14	7.30	7.30	7.30	7.30	7.30	7.40
ELEV	14	7.50	7.50	7.60	7.60	7.60	7.60
ELEV	14	7.60	7.60	7.60			
ELEV	15	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	15	7.30	7.30	7.30	7.30	7.30	7.40
ELEV	15	7.50	7.50	7.60	7.60	7.60	7.60
ELEV	15	7.60	7.60	7.60			
ELEV	16	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	16	7.30	7.30	7.30	7.30	7.30	7.40
ELEV	16	7.50	7.50	7.60	7.60	7.60	7.60
ELEV	16	7.60	7.60	7.60			
ELEV	17	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	17	7.30	7.30	7.30	7.30	7.30	7.40
ELEV	17	7.50	7.50	7.60	7.60	7.60	7.60
ELEV	17	7.60	7.60	7.60			
ELEV	18	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	18	7.30	7.30	7.30	7.30	7.30	7.40
ELEV	18	7.50	7.50	7.60	7.60	7.60	7.60
ELEV	18	7.60	7.60	7.60			
ELEV	19	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	19	7.30	7.30	7.30	7.30	7.30	7.40
ELEV	19	7.50	7.50	7.60	7.60	7.60	7.60
ELEV	19	7.60	7.60	7.60			
ELEV	20	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	20	7.30	7.30	7.30	7.30	7.30	7.40
ELEV	20	7.50	7.50	7.60	7.60	7.60	7.60
ELEV	20	7.60	7.60	7.60			
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.30
ELEV	21	7.30	7.30	7.30	7.30	7.30	7.40
ELEV	21	7.50	7.50	7.60	7.60	7.60	7.60
ELEV	21	7.60	7.60	7.60			
HILL	1	7.30	7.30	7.30	7.30	7.30	7.30
HILL	1	7.30	7.30	7.30	7.30	7.30	7.30
HILL	1	7.30	7.30	7.30	7.40	7.40	7.50
HILL	1	7.60	7.60	7.60			
HILL	2	7.30	7.30	7.30	7.30	7.30	7.30
HILL	2	7.30	7.30	7.30	7.30	7.30	7.30
HILL	2	7.30	7.30	7.30	7.40	7.40	7.50
HILL	2	7.60	7.60	7.60			
HILL	3	7.30	7.30	7.30	7.30	7.30	7.30
HILL	3	7.30	7.30	7.30	7.30	7.30	7.30
HILL	3	7.30	7.30	7.30	7.40	7.40	7.50
HILL	3	7.60	7.60	7.60			
HILL	4	7.30	7.30	7.30	7.30	7.30	7.30
HILL	4	7.30	7.30	7.30	7.30	7.30	7.30
HILL	4	7.30	7.30	7.30	7.40	7.50	7.50
HILL	4	7.60	7.60	7.60			
HILL	5	7.30	7.30	7.30	7.30	7.30	7.30
HILL	5	7.30	7.30	7.30	7.30	7.30	7.40
HILL	5	7.40	7.40	7.40	7.50	7.50	7.60
HILL	5	7.60	7.60	7.60			
HILL	6	7.30	7.30	7.30	7.30	7.30	7.30
HILL	6	7.30	7.30	7.30	7.30	7.30	7.40
HILL	6	7.40	7.50	7.50	7.60	7.60	7.60
HILL	6	7.60	7.60	7.60			

HILL	7	7.30	7.30	7.30	7.30	7.30	7.30
HILL	7	7.30	7.30	7.30	7.30	7.30	7.40
HILL	7	7.50	7.50	7.60	7.60	7.60	7.60
HILL	7	7.60	7.60	7.60			
HILL	8	7.30	7.30	7.30	7.30	7.30	7.30
HILL	8	7.30	7.30	7.30	7.30	7.30	7.40
HILL	8	7.50	7.50	7.60	7.60	7.60	7.60
HILL	8	7.60	7.60	7.60			
HILL	9	7.30	7.30	7.30	7.30	7.30	7.30
HILL	9	7.30	7.30	7.30	7.30	7.30	7.40
HILL	9	7.50	7.50	7.60	7.60	7.60	7.60
HILL	9	7.60	7.60	7.60			
HILL	10	7.30	7.30	7.30	7.30	7.30	7.30
HILL	10	7.30	7.30	7.30	7.30	7.30	7.40
HILL	10	7.50	7.50	7.60	7.60	7.60	7.60
HILL	10	7.60	7.60	7.60			
HILL	11	7.30	7.30	7.30	7.30	7.30	7.30
HILL	11	7.30	7.30	7.30	7.30	7.30	7.40
HILL	11	7.50	7.50	7.60	7.60	7.60	7.60
HILL	11	7.60	7.60	7.60			
HILL	12	7.30	7.30	7.30	7.30	7.30	7.30
HILL	12	7.30	7.30	7.30	7.30	7.30	7.40
HILL	12	7.50	7.50	7.60	7.60	7.60	7.60
HILL	12	7.60	7.60	7.60			
HILL	13	7.30	7.30	7.30	7.30	7.30	7.30
HILL	13	7.30	7.30	7.30	7.30	7.30	7.40
HILL	13	7.50	7.50	7.60	7.60	7.60	7.60
HILL	13	7.60	7.60	7.60			
HILL	14	7.30	7.30	7.30	7.30	7.30	7.30
HILL	14	7.30	7.30	7.30	7.30	7.30	7.40
HILL	14	7.50	7.50	7.60	7.60	7.60	7.60
HILL	14	7.60	7.60	7.60			
HILL	15	7.30	7.30	7.30	7.30	7.30	7.30
HILL	15	7.30	7.30	7.30	7.30	7.30	7.40
HILL	15	7.50	7.50	7.60	7.60	7.60	7.60
HILL	15	7.60	7.60	7.60			
HILL	16	7.30	7.30	7.30	7.30	7.30	7.30
HILL	16	7.30	7.30	7.30	7.30	7.30	7.40
HILL	16	7.50	7.50	7.60	7.60	7.60	7.60
HILL	16	7.60	7.60	7.60			
HILL	17	7.30	7.30	7.30	7.30	7.30	7.30
HILL	17	7.30	7.30	7.30	7.30	7.30	7.40
HILL	17	7.50	7.50	7.60	7.60	7.60	7.60
HILL	17	7.60	7.60	7.60			
HILL	18	7.30	7.30	7.30	7.30	7.30	7.30
HILL	18	7.30	7.30	7.30	7.30	7.30	7.40
HILL	18	7.50	7.50	7.60	7.60	7.60	7.60
HILL	18	7.60	7.60	7.60			
HILL	19	7.30	7.30	7.30	7.30	7.30	7.30
HILL	19	7.30	7.30	7.30	7.30	7.30	7.40
HILL	19	7.50	7.50	7.60	7.60	7.60	7.60
HILL	19	7.60	7.60	7.60			
HILL	20	7.30	7.30	7.30	7.30	7.30	7.30
HILL	20	7.30	7.30	7.30	7.30	7.30	7.40
HILL	20	7.50	7.50	7.60	7.60	7.60	7.60
HILL	20	7.60	7.60	7.60			
HILL	21	7.30	7.30	7.30	7.30	7.30	7.30
HILL	21	7.30	7.30	7.30	7.30	7.30	7.40

```
                HILL    21      7.50      7.50      7.60      7.60      7.60      7.60
                HILL    21      7.60      7.60      7.60
   GRIDCART UCART8 END
** DESCRREC "" ""
   DISCCART    633567.35   4263881.86    7.28    7.28
   DISCCART    633568.14   4263873.93    7.20    7.20
** DESCRREC "UCART6" "Receptors generated from Uniform Cartesian Grid"
   DISCCART    633620.46   4263655.68    7.01    7.01
   DISCCART    633616.14   4263669.31    7.01    7.01
   DISCCART    633620.46   4263669.31    7.01    7.01
   DISCCART    633611.82   4263682.94    7.01    7.01
   DISCCART    633616.14   4263682.94    7.01    7.01
   DISCCART    633620.46   4263682.94    7.01    7.01
   DISCCART    633607.50   4263696.57    7.01    7.01
   DISCCART    633611.82   4263696.57    7.01    7.01
   DISCCART    633616.14   4263696.57    7.01    7.01
   DISCCART    633620.46   4263696.57    7.01    7.01
   DISCCART    633603.18   4263710.20    7.01    7.01
   DISCCART    633607.50   4263710.20    7.01    7.01
   DISCCART    633611.82   4263710.20    7.01    7.01
   DISCCART    633616.14   4263710.20    7.01    7.01
   DISCCART    633620.46   4263710.20    7.01    7.01
   DISCCART    633598.86   4263723.83    7.01    7.01
   DISCCART    633603.18   4263723.83    7.01    7.01
   DISCCART    633607.50   4263723.83    7.01    7.01
   DISCCART    633611.82   4263723.83    7.01    7.01
   DISCCART    633616.14   4263723.83    7.01    7.01
   DISCCART    633620.46   4263723.83    7.01    7.01
   DISCCART    633594.54   4263737.46    7.01    7.01
   DISCCART    633598.86   4263737.46    7.01    7.01
   DISCCART    633603.18   4263737.46    7.01    7.01
   DISCCART    633607.50   4263737.46    7.01    7.01
   DISCCART    633611.82   4263737.46    7.01    7.01
   DISCCART    633616.14   4263737.46    7.01    7.01
   DISCCART    633620.46   4263737.46    7.01    7.01
   DISCCART    633590.22   4263751.09    7.01    7.01
   DISCCART    633594.54   4263751.09    7.01    7.01
   DISCCART    633598.86   4263751.09    7.01    7.01
   DISCCART    633603.18   4263751.09    7.01    7.01
   DISCCART    633607.50   4263751.09    7.01    7.01
   DISCCART    633611.82   4263751.09    7.01    7.01
   DISCCART    633616.14   4263751.09    7.01    7.01
   DISCCART    633620.46   4263751.09    7.01    7.01
   DISCCART    633585.90   4263764.72    7.01    7.01
   DISCCART    633590.22   4263764.72    7.01    7.01
   DISCCART    633594.54   4263764.72    7.01    7.01
   DISCCART    633598.86   4263764.72    7.01    7.01
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   DISCCART    633607.50   4263764.72    7.01    7.01
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   DISCCART    633616.14   4263764.72    7.01    7.01
   DISCCART    633620.46   4263764.72    7.01    7.01
   DISCCART    633581.58   4263778.35    7.01    7.01
   DISCCART    633585.90   4263778.35    7.01    7.01
   DISCCART    633590.22   4263778.35    7.01    7.01
   DISCCART    633594.54   4263778.35    7.01    7.01
   DISCCART    633598.86   4263778.35    7.01    7.01
   DISCCART    633603.18   4263778.35    7.01    7.01
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DISCCART	633611.82	4263778.35	7.01	7.01
DISCCART	633616.14	4263778.35	7.01	7.01
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DISCCART	633581.58	4263791.98	7.01	7.01
DISCCART	633585.90	4263791.98	7.01	7.01
DISCCART	633590.22	4263791.98	7.01	7.01
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DISCCART	633598.86	4263791.98	7.01	7.01
DISCCART	633603.18	4263791.98	7.01	7.01
DISCCART	633607.50	4263791.98	7.01	7.01
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DISCCART	633616.14	4263791.98	7.01	7.01
DISCCART	633620.46	4263791.98	7.01	7.01
DISCCART	633572.94	4263805.61	7.01	7.01
DISCCART	633577.26	4263805.61	7.01	7.01
DISCCART	633581.58	4263805.61	7.01	7.01
DISCCART	633585.90	4263805.61	7.01	7.01
DISCCART	633590.22	4263805.61	7.01	7.01
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DISCCART	633598.86	4263805.61	7.01	7.01
DISCCART	633603.18	4263805.61	7.01	7.01
DISCCART	633607.50	4263805.61	7.01	7.01
DISCCART	633611.82	4263805.61	7.01	7.01
DISCCART	633616.14	4263805.61	7.01	7.01
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DISCCART	633568.62	4263819.24	7.01	7.01
DISCCART	633572.94	4263819.24	7.01	7.01
DISCCART	633577.26	4263819.24	7.01	7.01
DISCCART	633581.58	4263819.24	7.01	7.01
DISCCART	633585.90	4263819.24	7.01	7.01
DISCCART	633590.22	4263819.24	7.01	7.01
DISCCART	633594.54	4263819.24	7.01	7.01
DISCCART	633598.86	4263819.24	7.01	7.01
DISCCART	633603.18	4263819.24	7.01	7.01
DISCCART	633607.50	4263819.24	7.01	7.01
DISCCART	633611.82	4263819.24	7.01	7.01
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DISCCART	633564.30	4263832.87	7.01	7.01
DISCCART	633568.62	4263832.87	7.01	7.01
DISCCART	633572.94	4263832.87	7.01	7.01
DISCCART	633577.26	4263832.87	7.01	7.01
DISCCART	633581.58	4263832.87	7.01	7.01
DISCCART	633585.90	4263832.87	7.01	7.01
DISCCART	633590.22	4263832.87	7.01	7.01
DISCCART	633594.54	4263832.87	7.01	7.01
DISCCART	633598.86	4263832.87	7.02	7.02
DISCCART	633603.18	4263832.87	7.04	7.04
DISCCART	633607.50	4263832.87	7.05	7.05
DISCCART	633611.82	4263832.87	7.06	7.06
DISCCART	633616.14	4263832.87	7.07	7.07
DISCCART	633620.46	4263832.87	7.08	7.08
DISCCART	633559.98	4263846.50	7.01	7.01
DISCCART	633564.30	4263846.50	7.01	7.01
DISCCART	633568.62	4263846.50	7.01	7.01
DISCCART	633572.94	4263846.50	7.01	7.01

DISCCART	633577.26	4263846.50	7.01	7.01
DISCCART	633581.58	4263846.50	7.01	7.01
DISCCART	633585.90	4263846.50	7.01	7.01
DISCCART	633590.22	4263846.50	7.01	7.01
DISCCART	633594.54	4263846.50	7.02	7.02
DISCCART	633598.86	4263846.50	7.05	7.05
DISCCART	633603.18	4263846.50	7.08	7.08
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DISCCART	633616.14	4263846.50	7.17	7.17
DISCCART	633620.46	4263846.50	7.20	7.20
DISCCART	633555.66	4263860.13	7.05	7.05
DISCCART	633559.98	4263860.13	7.06	7.06
DISCCART	633564.30	4263860.13	7.06	7.06
DISCCART	633568.62	4263860.13	7.06	7.06
DISCCART	633572.94	4263860.13	7.06	7.06
DISCCART	633577.26	4263860.13	7.06	7.06
DISCCART	633581.58	4263860.13	7.06	7.06
DISCCART	633585.90	4263860.13	7.06	7.06
DISCCART	633590.22	4263860.13	7.06	7.06
DISCCART	633594.54	4263860.13	7.07	7.07
DISCCART	633598.86	4263860.13	7.10	7.10
DISCCART	633603.18	4263860.13	7.14	7.14
DISCCART	633607.50	4263860.13	7.18	7.18
DISCCART	633611.82	4263860.13	7.21	7.21
DISCCART	633616.14	4263860.13	7.25	7.25
DISCCART	633620.46	4263860.13	7.29	7.29
DISCCART	633551.34	4263873.76	7.12	7.12
DISCCART	633555.66	4263873.76	7.15	7.15
DISCCART	633559.98	4263873.76	7.18	7.18
DISCCART	633564.30	4263873.76	7.20	7.20
DISCCART	633568.62	4263873.76	7.20	7.20
DISCCART	633572.94	4263873.76	7.20	7.20
DISCCART	633577.26	4263873.76	7.20	7.20
DISCCART	633581.58	4263873.76	7.20	7.20
DISCCART	633585.90	4263873.76	7.20	7.20
DISCCART	633590.22	4263873.76	7.20	7.20
DISCCART	633594.54	4263873.76	7.20	7.20
DISCCART	633598.86	4263873.76	7.22	7.22
DISCCART	633603.18	4263873.76	7.24	7.24
DISCCART	633607.50	4263873.76	7.25	7.25
DISCCART	633611.82	4263873.76	7.27	7.27
DISCCART	633616.14	4263873.76	7.29	7.29
DISCCART	633620.46	4263873.76	7.30	7.30
DISCCART	633534.06	4263887.39	7.04	7.04
DISCCART	633538.38	4263887.39	7.08	7.08
DISCCART	633542.70	4263887.39	7.12	7.12
DISCCART	633547.02	4263887.39	7.16	7.16
DISCCART	633551.34	4263887.39	7.20	7.20
DISCCART	633555.66	4263887.39	7.24	7.24
DISCCART	633559.98	4263887.39	7.28	7.28
DISCCART	633564.30	4263887.39	7.32	7.32
DISCCART	633568.62	4263887.39	7.32	7.32
DISCCART	633572.94	4263887.39	7.32	7.32
DISCCART	633577.26	4263887.39	7.32	7.32
DISCCART	633581.58	4263887.39	7.32	7.32
DISCCART	633585.90	4263887.39	7.32	7.32
DISCCART	633590.22	4263887.39	7.32	7.32

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    DISCCART    633594.54    4263887.39    7.32    7.32
    DISCCART    633598.86    4263887.39    7.32    7.32
    DISCCART    633603.18    4263887.39    7.32    7.32
    DISCCART    633607.50    4263887.39    7.32    7.32
    DISCCART    633611.82    4263887.39    7.32    7.32
    DISCCART    633616.14    4263887.39    7.32    7.32
    DISCCART    633620.46    4263887.39    7.32    7.32
RE FINISHED
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** AERMOD Meteorology Pathway
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ME STARTING
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Data\Executive\10-14\Exec 10-14 N1MD.SFC"
   PROFFILE "L:\SSD FOLDERS\Modeling\AermodMet 14134\Not 1 Minute Met
Data\Executive\10-14\Exec 10-14 N1MD.PFL"
   SURFDATA 23232 2010 SACRAMENTO/EXECUTIVE_ARPT
   UAIRDATA 23230 2010 OAKLAND/WSO_AP
   PROFBASE 6.0 FEET
ME FINISHED
**
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** AERMOD Output Pathway
****************************************
**
**
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
** Auto-Generated Plotfiles
   PLOTFILE 1 ALL 1ST C:\25725res\25725RES.AD\01H1GALL.PLT 31
   PLOTFILE 1 STK1 1ST C:\25725res\25725RES.AD\01H1G001.PLT 32
   PLOTFILE PERIOD ALL C:\25725res\25725RES.AD\PE00GALL.PLT 33
   PLOTFILE PERIOD STK1 C:\25725res\25725RES.AD\PE00G000.PLT 34
OU FINISHED
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** Project Parameters
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** PROJCTN  CoordinateSystemUTM
** DESCPTN  UTM: Universal Transverse Mercator
** DATUM    World Geodetic System 1984
** DTMRGN   Global Definition
** UNITS    m
** ZONE     10
** ZONEINX  0
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