AP - 37

STAGE 2 REPORT (Event 4)

Date 6-6-13

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921 North Bivins
Amarillo, Texas 79107
Phone 806.467.0607
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911 W. Anderson Lane
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2901 State Highway 349
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318 East Taylor Street
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Artesia, New Mexico 88210
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ENVIRONMENTAL CONSULTING
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Toll Free: 866.742.0742
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MOBILE DUAL PHASE EXTRACTION REPORT
LOVINGTON DEEP 6 PIPELINE RELEASE
LEA COUNTY, NEW MEXICO
SRS # 2002-10312
NMOCD# AP-037

RECEIVED OCD
2013 SEP 20 P 2:05

PREPARED FOR:

PLAINS MARKETING, L.P.
333 CLAY STREET
SUITE 1600
HOUSTON, TEXAS 77002

PREPARED BY:

TALON/LPE
921 N. BIVINS
AMARILLO, TEXAS 79107

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JUNE 6, 2013

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I. MDPE SUMMARY REPORT AND WASTE DISPOSITION

A. MDPE Results

The following report summarizes data collected during the scheduled 24-hour High Vacuum Multi-Phase Extraction (MDPE) event conducted on February 27-28, 2013, at the Lovington Deep 6 Pipeline release site, located in Lea County, New Mexico. The objective of the MDPE treatment was to remove both vapor and liquid phase separated hydrocarbons (PSH) from onsite groundwater wells. Talon/LPE utilized an MDPE unit which consisted of an SVE extraction pump capable of generating vacuum up to 25" hg. Off gas vapors extracted from the extraction wells were destroyed using a propane-fired 1000-SCFM thermal oxidizer capable of processing 172.96 lbs/hr of gasoline.

A total of 9.5 hours (0.40 days) of PSH recovery was performed due to freezing of propane tank and inability of vendor to refill. MW2, MW13, MW-14, MW15, MW16 & MW17 for 9.5 hours.

Prior to and immediately following the event, the groundwater wells were gauged for groundwater elevation and PSH. Depth to groundwater ranges were measured in feet below the top of casing. Refer to Attachment 1 for a summary of data collected during the MDPE event.

The volume of PSH removed during the MDPE event is shown to reflect the portions of PSH in the liquid phase and as off-gas vapor. Air removal rates were calculated from velocity measurements recorded at the influent manifold prior to entry into the MDPE unit. PSH recovery and air flow data has been detailed and is contained in Table 1. One influent air sample was collected over the course of the event. This sample was submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. The influent sample was tested for Total-Gas Analysis (Hydrocarbon Composition) by GPA 2261-C6+. Laboratory analytical results can be found in Attachment 2.

Based on a combination of field vapor screening and collected laboratory samples, a combined estimated total of **285.44 equivalent gallons of hydrocarbons (Total)** were removed during the event. The combined volume of hydrocarbons were comprised of approximately **280 gallons of PSH (liquid phase)** and approximately **5.44 gallons as off-gas vapor**. The calculations used to estimate the off-gas vapor mass recovered reflect the mass of total hydrocarbons recovered and does not necessarily equate to an equal mass of the product released. The mass recovery calculations may be affected by variations in the specific gravity of hydrocarbon released, age of release, activity of aerobic and/or anaerobic processes, and site specific geochemical factors.

The cumulative air flow measurements for the MDPE event were calculated using a combination of field data measurements and Preso® B+ manufacturer provided formulas. **Air flow rates extracted from the recovery wells averaged 119.22 SCFM** during the event.

A portion of the extracted air flow rates measured is attributable to compressed air, which was "injected" into the extraction wells. This "injected" air is introduced into the extraction wells for the purpose of enhancing liquid recovery rates.

B. Air Quality

One influent air sample was collected during the event. The sample was submitted for laboratory testing in order to compare the predicted vapor concentrations (based on field-screening or calculated based on fuel consumption) to the actual vapor concentrations. The maximum influent concentration was recorded as 7,440 ppmv for Hydrocarbon Composition. Laboratory analytical results can be found in Attachment 2.

C. Waste Management and Disposition

A cumulative total of 1,679 gallons of fluid were generated during this event. The fluids were temporarily transferred to an on-site storage tank prior to being transferred to an authorized disposal facility. A copy of the waste ticket can be found in Attachment 4.

II. SYSTEM OPERATION DATA AND MASS RECOVERY CALCULATIONS

Formulae:

$$\text{Concentration (C\_mg/l)} = \frac{\text{C\_ppmv x Mol. wt. in mg(estimated) x 1000 x 0.000001}}{\text{0.0821 x Temp (K)}}$$

$$\text{Recovery Rate (lbs/hr)} = \frac{\text{(C\_mg/l) x 2.2 x (Flowrate) x 60 x 28.32}}{\text{1,000,000}}$$

Recovery (lbs) = (lbs/hr) x (hrs)

$$\text{Correction Factor (CF)} = \frac{\text{PID Reading(ppm)}}{\text{PID Reading at Time of Laboratory Analysis}}$$

$$\frac{\text{8.34 lbs}}{\text{gallon water}} \times \text{0.82 average specific gravity of light crude (estimated)} = \frac{\text{6.84 lbs light crude}}{\text{gallon}}$$

Table 1
System Operation Data and Mass Recovery Calculations

Time	Period (hours)	Influent Temp. (°f	Vacuum (in. hg)	Vacuum (in. h20)	Differential pressure (in. h20)	Flow (SCFM)	FID Readings (ppm)	Lab Result (ppmv)	Assigned Lab Result (ppmv)	Correction Factor (CF)	Adjusted Lab Result (ppmv)	Adjusted Lab Result (mg/L)	Recovery (lbs/hr)	Recovery in Period (lbs)	Total Recovery (lbs)
15:30	0.5	62	19	258.57	56	159.41	35789	-	7440.00	0.72	5325	6.40	3.82	1.91	1.91
16:00	0.5	62	19	258.57	55.1	158.12	50000	7440.00	7440.00	1.00	7440	8.95	5.29	2.64	4.55
17:00	1	62	18	244.96	31.8	125.49	36705	-	7440.00	0.73	5462	6.57	3.08	3.08	7.63
18:00	1	60	17	231.35	19.8	103.27	50000	-	7440.00	1.00	7440	8.98	3.47	3.47	11.10
19:00	1	56	16.5	224.55	19.3	104.31	50000	-	7440.00	1.00	7440	9.05	3.53	3.53	14.63
20:00	1	52	15.5	210.94	19.9	110.21	49766	-	7440.00	1.00	7405	9.08	3.74	3.74	18.37
21:00	1	50	15.5	210.94	19.8	110.15	50000	-	7440.00	1.00	7440	9.16	3.77	3.77	22.14
22:00	1	50	15.5	210.94	18.9	107.62	50000	-	7440.00	1.00	7440	9.16	3.68	3.68	25.83
23:00	1	50	15.5	210.94	19.3	108.75	50000	-	7440.00	1.00	7440	9.16	3.72	3.72	29.55
0:00	1	50	15	204.14	19.9	112.32	50000	-	7440.00	1.00	7440	9.16	3.85	3.85	33.40
1:00	1	50	15	204.14	19.7	111.76	50000	-	7440.00	1.00	7440	9.16	3.83	3.83	37.22
Event stopped short @ 01:45 due to freezing of propane and inability for vendor to refill tank.															
Averages:		54.91	16.50	224.55	27.23	119.22	47478.18						Total	37.22	

PSH Mass Recovered in Vapor Phase = 5.44 gallons

FID maximum Concentration = 50,000 PPM

Ex: Conversion from ppmv to mg/L (influent 1)

Measured Conc.	Molecular Wt.	Pressure	Gas Constant	Temp.	Temp.	Conc.
(ppmv)	(Grams)	(atm)	(atm.liter/K.mole)	(F)	(K)	(C_mg/l)
5325	26.6008	1	0.0821	62	289.6666667	6.404548741

Inputs are the green values.
Calculated values are yellow.
Constants are purple values.
Outpus are the blue values.

Liquid-phase Hydrocarbon Recovery

∏ * r2 * h = volume

Total Hydrocarbon Recovery

PSH Mass Recovered in Vapor Phase =	37.22	lbs
	5.44	gallons
PSH Mass Recovered in Liquid Phase =	1915.20	lbs
	280.00	gallons
TOTAL =	1952.42	lbs
	285.44	gallons

Gallons removed determined at time of pick up

PSH Volume in Gallons= 280
PSH Mass in Pounds= 1915.2

SG = 0.82

% Vol. (Wt. %) Hydrocarbon to ppmv - Influent 1

Compound	Molecular Weight (g/mol)	Wt. %	=	ppmv
Methane (CH4)	16.04	0		0.00
Ethane (C2H6)	30.07	0		0.00
Propane (C3H8)	44.10	0		0.00
Iso-Butane (C4H10)	58.12	0.006		60.00
N-Butane (C4H10)	58.12	0.016		160.00
Iso-Pentane (C4H12)	72.15	0.048		480.00
N-Pentane (C5H12)	72.15	0.091		910.00
Hexane+ (C6H14)	97.40	0.583		5830.00
			Total	7440.00

*Hexane+ is treated as 60% hexanes, 30 % heptanes, and 10 % octanes, as such its (0.6*93.1887)+(0.3*100.2019)+(0.1*114.2285) = 97.3966

Molecular Weight Calculations

component	Molecular Weight (g/mol)	mol%
Nitrogen (N2)	28.016	97.0480
Methane (CH4)	16.0425	0.0000
Carbon Dioxide (CO2)	44.011	2.7070
Ethane (C2H6)	30.089	0.0000
Propane (C3H8)	44.0956	0.0000
Iso-Butane (C4H10)	58.1222	0.0030
N-Butane (C4H10)	58.1222	0.0080
Iso-Pentane (C4H12)	72.1488	0.0190
N-Pentane (C5H12)	72.1488	0.0360
Hexane+	97.3966	0.1790
	Total	100
	Calculated MW	28.6008

Calculated MW= $\frac{\text{sum (individual component MW x their reported mol\%)}}{100}$

ppmv= % Vol x 10,000

ATTACHMENT 1

MDPE Field Logs

MDPE FIELD NOTES					
Site Name:	Lovington Deep 6			Event #:1	
Location:	Lea County, NM			Arrive at site:	2/27/13 13:30
Date:	2/28/2013				
Job#:	700376.051.05	SRS:	2002-10312	Start Vac:	2/27/13 14:45
Phase:	MDPE4	Unit:	1107	Stop Vac:	2/28/13 1:00
Onsite Personnel:	L. Bridges & B. Huntington			Leave Site:	2/28/13 12:30

GAUGING DATA							
WELL#	BEFORE			AFTER			COMMENTS
	PSH	GW	PSH-T	PSH	GW	PSH-T	
MW-2	63.63	67.81	4.18	64.35	64.72	0.37	Stinger set @ 65'
MW-13	64.33	68.89	4.56	65.05	65.38	0.33	Stinger set @ 65'
MW-14	64.95	65.83	0.88	-	65.13	-	Stinger set @ 65'
MW-15	64.86	64.93	0.07	Not Gauged			
MW-16	64.45	65.98	1.53	64.73	64.74	0.01	Stinger set @ 65'
MW-17	64.13	68.13	4.00	64.78	65.08	0.30	Stinger set @ 65'
MW-3		64.78					
WASTE:	H2O:	1399		PSH:	280		TOTAL (GAL): 1679

Sample Name	Analysis	Date:	Time:	Comments:
INFLUENT	C6+	27-Feb-13	16:00:00 PM	FID = >50000
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Notes:
Tank #1 - Total 53.75" with PSH@44.75" = Total 1679 gallons and PSH at 280 gallons
Hand Bailed MW15
Adjusted vacuum and well depth as discussed w/pm
Started stinger at 65 and adjusted from there

Start Date: 28-Feb-13

MDPE FIELD DATA - 24hr 1107 Event#1

		Well Flow						Well Data				
TIME	SAMPLE TAKEN *	Inflent temp. (°f)	Diff. Pressure (INH20) 2" Preso	Vac (In.Hg)	FID Composite (PPM)	Propane Tank (%-size) 75	EXHAUST TEMP F	COMMENTS: MW2 VAC (INH2O)	MW13 VAC (INH2O)	MW14 VAC (INH2O)	MW16 VAC (INH2O)	MW17 VAC (INH2O)
15:30		62	56.6	19	35789	32	1406	5.9	24.8	21.5	17.8	10.8
16:00	*	62	55.1	19	>50k	70	1408	5.8	23.9	22	11.9	9.1
17:00		62	31.8	18	36705	69	1407	5	22.4	15.8	9.3	8.1
18:00		60	19.8	17	>50k	64	1410	2.7	19.6	12.9	8.8	6.5
19:00		56	19.3	16.5	>50k	59	1410	3.1	20.1	13.3	9.1	6.5
20:00		52	19.9	15.5	49766	55	1408	3.2	20.4	13	9	5.6
21:00		50	19.8	15.5	>50k	50	1410	3.3	19.9	12.8	8.7	6.3
22:00		50	18.9	15.5	>50k	45	1410	2.8	20.4	13.2	8.4	6.2
23:00		50	19.3	15.5	>50k	41	1407	2.4	20.1	13.8	7.3	6.3
0:00		50	19.9	15	>50k	36	1415	3.2	19.8	12.9	7.9	6.2
1:00		50	19.7	15	>50k	33	1409	2.9	19.9	13.6	7.1	6.1

Soil Vacuum Influence

Observation Well	MW15
Extraction Well (EW)	MW2
Time:	In.H2O
16:00	0.05

ATTACHMENT 2

Laboratory Analytical Results

Certificate of Analysis

Number: 1030-2013030100-001A

Simon I. Walshe, CAPM
Talon/LPE
921 N. Bivins St.
Amarillo Texas 79107

March 06, 2013

Sample ID:
Station Name : Influent #1
Station Number :
Station Location : Hobbs, NM.
Sample Point:

Sampled By: BH
Sample Of: Gas Spot
Sample Date: 02/28/2013 10:00
Sample Conditions: N.G. Pres. , N.G. Temp.
PO / Ref. No:

ANALYTICAL DATA

Components	Mol %	Wt %	GPM at 14.650 psia	Method	Lab Tech.	Date Analyzed
				GPA-2261 M	DK	3/5/2013 4:16:22 AM
Nitrogen	97.048	95.089				
Carbon Dioxide	2.707	4.167				
Iso Butane	0.003	0.006	0.001			
n-Butane	0.008	0.016	0.003			
Iso Pentane	0.019	0.048	0.007			
n-Pentane	0.036	0.091	0.013			
Hexanes Plus	0.179	0.583	0.078			
	100.000	100.000	0.102			
	C2 +	C3 +	iC5 +			
GPM TOTAL :	0.102	0.102	0.098			
Relative Density	Real Gas			0.9871		
Calculated Molecular Weight				28.59		
Compressibility Factor				0.9996		

GPA 2172-09 Calculation :

Calculated Gross BTU per ft³ @14.650 psia & 60°F

Real Gas: Dry BTU: 12
Water Sat. Gas_Base BTU: 11

Comments : H2O Mol% - 1.75_Wt% - 1.11

Hydrocarbon Laboratory Manager

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP or GPA guidelines for quality assurance, unless otherwise stated

SPL, Inc.
Analysis Request Chain of Custody Record

SPL	SPL Work Order No.	Acct. Mate Code: NEEDS CLIENT CODE	Dept. Code	SPL Page 1 of 1

Report To: (Company Name):	Talon/LPE, Ltd			
Address:	921 N. Bivins St.			
City/State/Zip:	Amarillo	TX	79107	
Contact:	Simon J. Walshe, CAPM	swalshe@talonlpe.com		
Phone:	806-350-8872	Fax	806-467-0622	
Invoice To: (Company Name):	Talon/LPE, Ltd			
Address:	921 N. Bivins St			
City/State/Zip:	Amarillo	TX	79107	
Contact:	Talon - Accounts Payable	acctpayables@talonlpe.com		
Phone:	806-467-0607	Fax:	806-372-6603	
Client PO# or Ref. No.	N/A			
Contract/Proposal #: (i.e. SPLQ####)	SPLQ5270			

Project/Station Name:	Project/Station Number:	Project/Station Location:	Requested TAT*
~~Influent Soil Vapor~~ Lovington Deep 6"		Hobbs, NM	10 business days

Special Instructions: 700376.651.05

Indicate Billing Type (Place "X", where appropriate)	Net 30 day Acct		Check #	
	Credit Card		<<<Contact SPL, Inc for CC payment arrangements.	

* Surcharges May Apply (See quote for details)

[1] Terms: Cylinders will be rented for $10/cyl. All cylinders checked out are to be returned within 21 days, whether they contain sample or not. Cylinders not returned after 30 days will be considered lost and will be billed at current replacement cost.

Requested Analysis (Place an "X" next to Sample ID below)

Sample ID (used to log/track sample)	Sample Date	Sample Time	Sample Type (Gas/Liq./Solid)	Duplicate	Composite	Spot	Cylinder Tracking Info[1] Cylinder #	Date Out	Date In	GPA-2261-C6+	Comments
Effluent #1	2-28-13	1600	GAS							X	

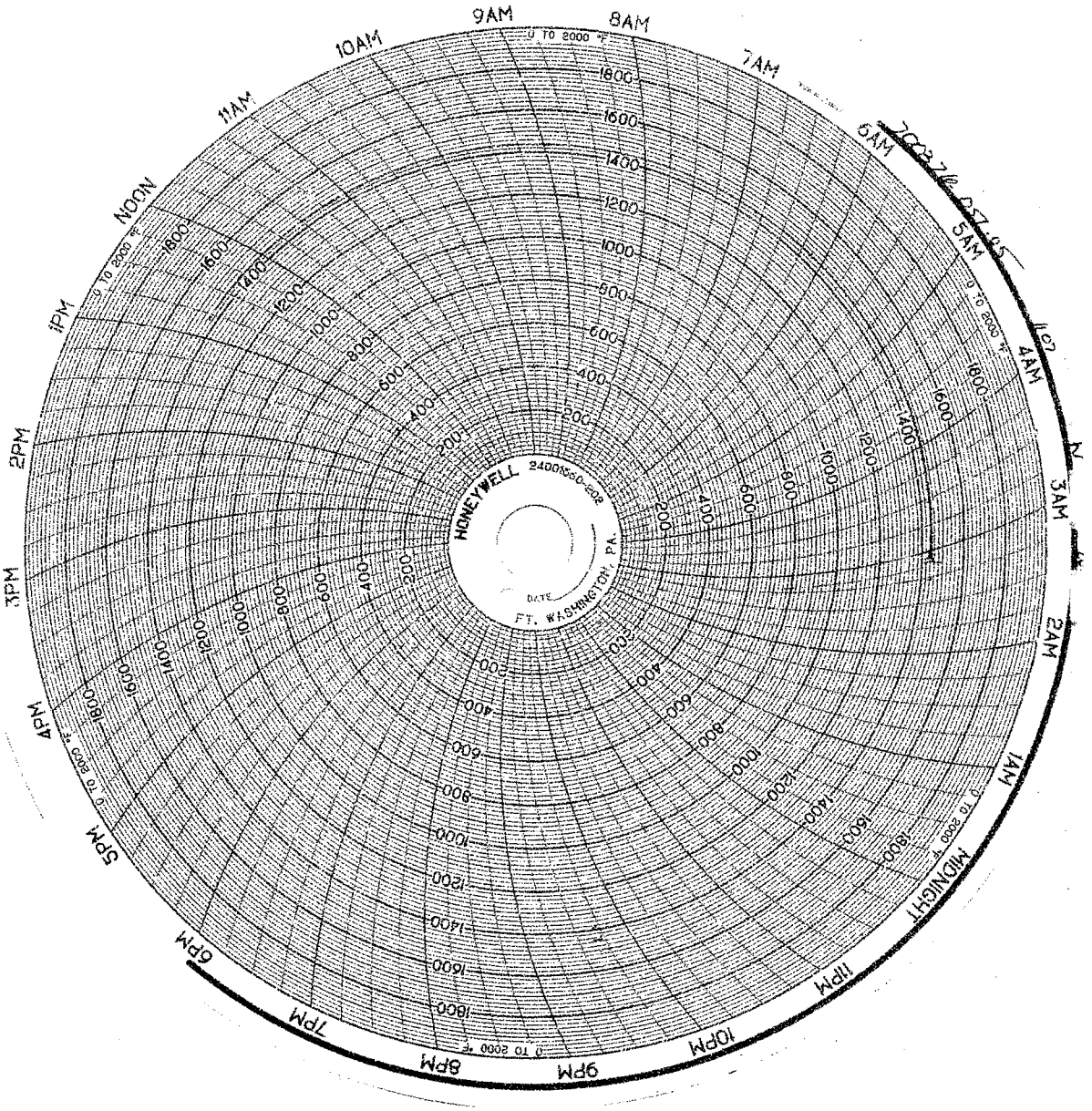
Sampled By-Print Name:	B Huntington			Received By-Company:		
Signature:						
Relinquished By-Print Name:	[signature]	Date: 3-1-13	Time: 1230	Received By-Print Name: Luis Cabrera	Date: 3/4/13	Time
Signature:				Signature: [signature]		
Relinquished By-Print Name:		Date:	Time:	Received By-Print Name:	Date:	Time:
Signature:				Signature:		
Relinquished By-Print Name:		Date:	Time:	Received By-Print Name:	Date:	Time:
Signature:				Signature:		

Choose SPL Facility>>>	Corporate HQ - Houston, TX	Ship to Address:	8820 Interchange Dr., Houston, TX 77054	Phone:	713.660.0901

Note - As a convenience to our clients, this form is available in an electronic format. Please contact one of our offices above for the form to be e-mailed to you.

ATTACHMENT 3

Oxidizer Charts


HONEYWELL
FT. WASHINGTON, PA.
DATE
0 TO 2000 °F
9AM
8AM
7AM
6AM
5AM
4AM
3AM
2AM
1AM
MIDNIGHT
11PM
10PM
9PM
8PM
7PM
6PM
5PM
4PM
3PM
2PM
1PM
NOON
11AM
10AM

ATTACHMENT 4

Waste Ticket

24-HOUR SERVICE CALL
LOVINGTON 396-4948
TATUM 398-4961

GANDY CORPORATION

KILL TRUCKS — VACUUM TRUCKS — WINCH TRUCKS —
TANK CLEANING — ROUSTABOUTING
PRC #14225

P.O. BOX 2140
LOVINGTON, NEW MEXICO 88260

479008

Date 3-5-93 Truck No. 374

Company Ol[illegible] Purchase Order No. ______ Invoice Number ______

From ______ Rig No. ______ Location ______

To Lease [illegible] 6 Well No. ______ Location ______

Time Out ______ A.M. P.M. Time In ______ A.M. P.M.

Diesel / Crude Oil / Brine Water / Salt Water / Fresh Water / Mud / Bbls. Hauled 25

Driver, Operator or Pusher

Helper

Helper

Helper

Other Charges

Description of Work: [illegible]

TIME	RATE	AMOUNT
	Sub Total	
	Sales Tax	
	TOTAL	

Authorized by: [illegible]