



Wednesday, July 20, 2016

Laine Sumner
CH2M HILL Plateau Remediation Company
2420 Stevens Center
Richland, WA 99352

Re: ALS Workorder: 1607144
Project Name: 200W Pump & Treat - Treatment Plant Water Sampling
Project Number: F15-005

Dear Ms. Sumner:

One water sample was received from CH2M HILL Plateau Remediation Company, on 5/28/2016. The sample was scheduled for the following analysis:

Metals

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

A handwritten signature in black ink, appearing to read 'Julie Ellingson'.

ALS Environmental
Julie Ellingson
Project Manager

RECHECK, RECOUNT, OR REANALYSIS ORDER

06/23/2016

Order Number: 160623ALS-R8882

ALS Environmental Ft. Collins

225 Commerce Drive

Fort Collins, CO 80524

Sample Delivery Group:ALS1605585

Method Name:6020_METALS_ICPMS

Sample#: B35730

Sample Date: 5/27/2016 8:12:00 AM

SAF #:F15-005

Lab Sample ID	RDR Action Start Date	Constituent	Action	TAT (Hardcopy/EDD)
1605585-2	6/23/2016 10:47:10 AM	Uranium	REANALYZE	15 Days / 15 Days
Special Instructions:	Please rereun for all originally requested 6020 metals. SLF 06/23/2016			

Deliver Report Results to:CHPRC

P.O. Box 1600

Richland, WA 99352

C/O Mr.Scot Fitzgerald

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Alaska (AK)	CO01099
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Connecticut (CT)	PH-0232
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
L-A-B (DoD ELAP/ISO 170250)	L2257
Louisiana (LA)	05057
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

ALS Environmental -- FC

Sample Number(s) Cross-Reference Table

OrderNum: 1607144

Client Name: CH2M HILL Plateau Remediation Company

Client Project Name: 200W Pump & Treat - Treatment Plant Water Sampling

Client Project Number: F15-005

Client PO Number: BOA 54854

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
B35730	1607144-2		WATER	27-May-16	8:12

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2M Hill Plateau Remediation Company

COMPANY CONTACT: SUMNER, LC
 TELEPHONE NO.: 376-3922
 PROJECT COORDINATOR: SUMNER, LC
 PRICE CODE: 7C
 PROJECT DESIGNATION: 200W Pump & Treat - Treatment Plant Water Sampling
 SAF NO.: F15-005
 AIR QUALITY:
 DATA TURNAROUND: 15 Days / 15 Days
 COA: 303700
 METHOD OF SHIPMENT: FEDERAL EXPRESS
ORIGINAL

FIELD LOGBOOK NO.: **101-4-49115**
 ACTUAL SAMPLE DEPTH: **N/A**
 OFFSITE PROPERTY NO.: **6675**
 BILL OF LADING/AIR BILL NO.: **7763 9629 9606**

COLLECTOR: K.C. Patterson/CHPRC
 SAMPLING LOCATION: 289-TA, Pre UJX Resin Column, Valve V25-Y11A1
 ICE CHEST NO.: **Gus-388**
 SHIPPED TO: ALS Environmental Ft. Collins

MATRIX*
 A=Air
 DL=Drum
 L=Liquid
 O=Oil
 S=Soil
 SE=Sediment
 T=Tissue
 V=Vegetation
 W=Water
 WI=Wipe
 X=Other

PRESCRIPTION
 HNO3 to pH <2
 NaOH to pH >=12/Cool
 <=6C
 6 Months
 14 Days

HOLDING TIME
 G/P P
 1 1
 500ml 125ml

NO. OF CONTAINER(S)
 1

VOLUME
 500ml

SAMPLE ANALYSIS
 9010_CYANIDE: COMMON (Cyanide);
 SEE ITEM (1) IN SPECIAL INSTRUCTIONS (Cyanide);

SPECIAL HANDLING AND/OR STORAGE

SAMPLE NO. **(2)**
MATRIX* WATER
SAMPLE DATE MAY 27 2016
SAMPLE TIME 0812

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
K.C. Patterson/CHPRC	MAY 27 2016 0800	Frank Hall CHPRC	MAY 27 2016 0800
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Frank Hall CHPRC	MAY 27 2016 1000	FEDEX	5-28-16 1000
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Frank Hall CHPRC	MAY 27 2016 1000	FEDEX	5-28-16 1000
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Frank Hall CHPRC	MAY 27 2016 1000	FEDEX	5-28-16 1000
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Frank Hall CHPRC	MAY 27 2016 1000	FEDEX	5-28-16 1000

SPECIAL INSTRUCTIONS

TRVL-16-127
 (1) 6020_METALS_ICPMS: COMMON {Aluminum, Chromium, Cobalt, Copper, Molybdenum, Selenium}; 6020_METALS_ICPMS: COMMON (Add-on) {Manganese, Nickel, Uranium, Zinc}; 6010_METALS_ICP: COMMON {Calcium, Iron, Magnesium, Potassium, Sodium}; 6010_METALS_ICP: COMMON (Add-on) {Boron};

LABORATORY SECTION: **11**
 RECEIVED BY: **Frank Hall**
 DISPOSAL METHOD: **11**

TITLE: **TRVL-16-127**

DATE/TIME: **5/25/2016**

PRINTED ON 5/25/2016

FSR ID = FSR31342

TRVL NUM = TRVL-16-127

A-6003-618 (REV 2)



ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHPRC

Workorder No: 1607144 160558576

Project Manager: JME

Initials: SDM Date: 5-28-16

1. Does this project require any special handling in addition to standard ALS procedures?		YES	<input checked="" type="radio"/> NO
2. Are custody seals on shipping containers intact?	NONE	<input checked="" type="radio"/> YES	NO
3. Are Custody seals on sample containers intact?	NONE	<input checked="" type="radio"/> YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		<input checked="" type="radio"/> YES	NO
5. Are the COC and bottle labels complete and legible?		<input checked="" type="radio"/> YES	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		<input checked="" type="radio"/> YES	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	<input checked="" type="radio"/> YES	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	<input checked="" type="radio"/> YES	NO
9. Are all aqueous non-preserved samples pH 4-9?	<input checked="" type="radio"/> N/A	YES	NO
10. Is there sufficient sample for the requested analyses?		<input checked="" type="radio"/> YES	NO
11. Were all samples placed in the proper containers for the requested analyses?		<input checked="" type="radio"/> YES	NO
12. Are all samples within holding times for the requested analyses?		<input checked="" type="radio"/> YES	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		<input checked="" type="radio"/> YES	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ___ < green pea ___ > green pea	<input checked="" type="radio"/> N/A	YES	NO
15. Do any water samples contain sediment? Amount of sediment: ___ dusting ___ moderate ___ heavy	Amount N/A	YES	<input checked="" type="radio"/> NO
16. Were the samples shipped on ice?		<input checked="" type="radio"/> YES	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #2 <input checked="" type="radio"/> #4	RAD ONLY	<input checked="" type="radio"/> YES	NO
Cooler #: <u>1</u>			
Temperature (°C): <u>2.4</u>			
No. of custody seals on cooler: <u>2</u>			
External µR/hr reading: <u>11</u>			
Background µR/hr reading: <u>11</u>			
Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? <input checked="" type="radio"/> YES NO / NA (If no, see Form 008.)			

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

If applicable, was the client contacted? YES / NO NA Contact: _____ Date/Time: _____

Project Manager Signature / Date: [Signature] 5/29/16

1607144
1605585

ORIGIN ID: PSCA (509) 528-9426
LESLY WALL
CH2M
8267 LATAH ST.
8269 LATAH ST.
RICHLAND, WA 99354
UNITED STATES US

SHIP DATE: 27MAY16
ACTWGT: 51.00 LB
CAD: 107066051/NET3730

BILL THIRD PARTY

TO JULIE ELLINGSON
ALS GLOBAL
225 COMMERCE DRIVE

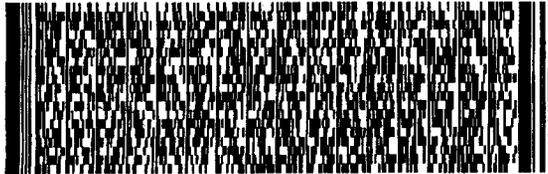
FORT COLLINS CO 80524

(970) 490-1511 REF: PTR# 6675

INV. PO: DEPT:

11
-2
2.4%

5401163031727F



FedEx Express



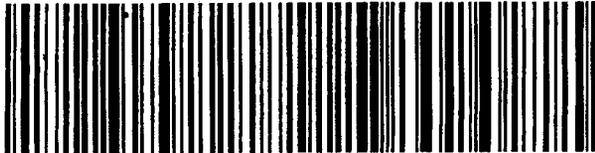
INTERNATIONAL

TRK# 7763 9629 9606
0201

SATURDAY 12:00P
PRIORITY OVERNIGHT

DSR
80524
CO-US DEN

X0 FTCA





Metals Case Narrative

CH2M HILL Plateau Remediation Company

200W Pump & Treat – Treatment Plant Water Sampling – F15-005

Work Order Number: 1607144

1. This report consists of 1 water sample. This report is a re-log from work order 1605585-2.
2. The sample was received cool and intact by ALS on 05/28/16.
3. The sample had a pH less than 2 upon receipt.
4. The sample was prepared and analyzed based on SW-846, 3rd Edition procedures.

For analysis by ICP-MS, the sample was digested following method 3005A and the current revision of SOP 806.

5. Analysis by ICP-MS followed method 6020A and the current revision of SOP 827.
6. All standards and solutions are NIST traceable and were used within their recommended shelf life.
7. The sample was prepared and analyzed within the established hold time.

All in house quality control procedures were followed, as described below.

8. General quality control procedures.
 - A preparation (method) blank and laboratory control sample were digested and analyzed with the sample in this digestion batch.
 - The preparation (method) blank associated with this digestion batch was below the reporting limit for the requested analyte. Aluminum has results above the MDL. Sample results have been compared to the blank results.
 - All laboratory control sample criteria were met.



- All initial and continuing calibration blanks were below the reporting limit for the requested analyte.
- All initial and continuing calibration verifications were within the acceptance criteria for the requested analyte.
- The interference check samples associated with Method 6020A were analyzed.

9. Matrix specific quality control procedures.

Sample 1607144-2 was designated as the quality control sample for this analysis.

Similarity of matrix and therefore relevance of the QC results should not be automatically inferred for any sample other than the native sample selected for QC.

- A matrix spike and matrix spike duplicate were digested and analyzed with this batch. All acceptance criteria for accuracy were met.
- Matrix spike recoveries could not be evaluated for the following analyte:

<u>Analyte</u>	<u>Sample ID</u>
Uranium	1607144-2

The concentration of this analyte in the native sample was greater than four times the concentration of matrix spike added during the digestion. When sample concentration is that much greater than the spike added, spike recoveries may not be accurate. The laboratory control sample indicates that the digestion and analysis were in control.

- A serial dilution was analyzed with this ICP batch. All acceptance criteria were met.

10. It is a standard practice that samples for ICP-MS are analyzed at a dilution. The 10X factor can be considered an artifact of the prep and does not indicate a secondary dilution and is therefore not flagged as a dilution.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



Jill Latelle
Inorganics Primary Data Reviewer

7/15/16
Date



April E. Elly
Inorganics Final Data Reviewer

7/20/16
Date



Inorganic Data Reporting Qualifiers

The following qualifiers are used as needed by the laboratory when reporting results of inorganic analyses.

- Result qualifier -- A "B" is entered if the reported value was obtained from a reading that was less than the Reporting Limit but greater than or equal to the Method Detection Limit (MDL). If the analyte was analyzed for but not detected a "U" is entered. For samples, negative values are reported as non-detects ("U" flagged). For blanks, if the absolute value of the negative value is above the MDL and below the reporting limit, then the result is "B" flagged.
- QC qualifier -- Specified entries and their meanings are as follows:
 - E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
 - M - Duplicate injection precision was not met.
 - N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
 - Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
 - * - Duplicate analysis (relative percent difference) not within control limits.
 - S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.
 - C - The analyte was detected in both the sample and the associated QC blank, and the sample concentration was $\leq 20X$ the blank concentration.
 - D - Analyte was reported at a secondary dilution factor, typically $DF > 1$ (i.e., the primary preparation required dilution to either bring the analyte within the calibration range or to minimize interference). Required for organics/wetchem if the sample was diluted.

Total Recoverable ICPMS Metals

Method SW6020A

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1607144

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 200W Pump & Treat - Treatment Plant Water Sampling F15-005

Field ID:	B35730
Lab ID:	1607144-2

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 27-May-16

Date Extracted: 12-Jul-16

Date Analyzed: 13-Jul-16

Prep Method: SW3005 Rev A

Prep Batch: IP160712-2

QCBatchID: IP160712-2-3

Run ID: IM160713-11A17

Cleanup: NONE

Basis: As Received

File Name: 091SMPL_

Analyst: Brent A. Stanfield

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

Analysis ReqCode: 6020_METALS_I

CASNO	Target Analyte	Dilution Factor	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	10	120	100	14	C	
7440-47-3	CHROMIUM	10	14	10	1.1		
7440-48-4	COBALT	10	0.27	5	0.07	B	
7440-50-8	COPPER	10	1.1	8	1.1	U	
7439-96-5	MANGANESE	10	0.96	5	0.3	B	
7439-98-7	MOLYBDENUM	10	5.2	2	0.41		
7440-02-0	NICKEL	10	4.2	20	4.2	U	
7782-49-2	SELENIUM	10	3.6	10	0.66	B	
7440-61-1	URANIUM	10	83	0.1	0.027		
7440-66-6	ZINC	10	9.1	100	9.1	U	

Data Package ID: im1607144-1

7/20/2016
ALS1607144

ICPMS Metals

Method SW6020A

Method Blank

Lab Name: ALS Environmental -- FC

Work Order Number: 1607144

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 200W Pump & Treat - Treatment Plant Water Sampling F15-005

Lab ID: IP160712-2MB

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 12-Jul-16

Date Analyzed: 13-Jul-16

Prep Batch: IP160712-2

QCBatchID: IP160712-2-3

Run ID: IM160713-11A17

Cleanup: NONE

Basis: N/A

File Name: 066SMPL_

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	DF	Result	RptLimit/ LOQ/LOD	MDL/DL	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	10	39	100	14	B	
7440-47-3	CHROMIUM	10	1.1	10	1.1	U	
7440-48-4	COBALT	10	0.07	5	0.07	U	
7440-50-8	COPPER	10	1.1	8	1.1	U	
7439-96-5	MANGANESE	10	0.3	5	0.3	U	
7439-98-7	MOLYBDENUM	10	0.41	2	0.41	U	
7440-02-0	NICKEL	10	4.2	20	4.2	U	
7782-49-2	SELENIUM	10	0.66	10	0.66	U	
7440-61-1	URANIUM	10	0.027	0.1	0.027	U	
7440-66-6	ZINC	10	9.1	100	9.1	U	

Data Package ID: im1607144-1

Date Printed: Friday, July 15, 2016

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.820

7/20/2016
ALS1607144

ICPMS Metals

Method SW6020A

Laboratory Control Sample

Lab Name: ALS Environmental -- FC

Work Order Number: 1607144

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 200W Pump & Treat - Treatment Plant Water Sampling F15-005

Lab ID: IM160712-2LCS

Sample Matrix: WATER

% Moisture: N/A

Date Collected: N/A

Date Extracted: 07/12/2016

Date Analyzed: 07/13/2016

Prep Method: SW3005A

Prep Batch: IP160712-2

QC Batch ID: IP160712-2-3

Run ID: IM160713-11A17

Cleanup: NONE

Basis: N/A

File Name: 068SMPL_

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

Clean DF: 1

CASNO	Target Analyte	Spike Added	LCS Result	Reporting Limit	Result Qualifier	LCS % Rec.	Control Limits
7429-90-5	ALUMINUM	5000	4670	100		93	80 - 120%
7440-47-3	CHROMIUM	500	477	10		95	80 - 120%
7440-48-4	COBALT	100	96.9	5		97	80 - 120%
7440-50-8	COPPER	1000	1010	8		101	80 - 120%
7439-96-5	MANGANESE	100	96.5	5		97	80 - 120%
7439-98-7	MOLYBDENUM	100	95.6	2		96	80 - 120%
7440-02-0	NICKEL	500	486	20		97	80 - 120%
7782-49-2	SELENIUM	100	97.2	10		97	80 - 120%
7440-61-1	URANIUM	10	9.91	0.1		99	80 - 120%
7440-66-6	ZINC	2000	1930	100		97	80 - 120%

Data Package ID: im1607144-1

Date Printed: Friday, July 15, 2016

ALS Environmental -- FC

Page 1 of 1

LIMS Version: 6.820

7/20/2016
ALS1607144

ICPMS Metals

Method SW6020A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1607144

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 200W Pump & Treat - Treatment Plant Water Sampling F15-

Field ID: B35730
LabID: 1607144-2MS

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 27-May-16
Date Extracted: 12-Jul-16
Date Analyzed: 13-Jul-16
Prep Method: SW3005 Rev A

Prep Batch: IP160712-2
QCBatchID: IP160712-2-3
Run ID: IM160713-11A17
Cleanup: NONE
Basis: As Received

Sample Aliquot: 50 ml
Final Volume: 50 ml
Result Units: UG/L
File Name: 094SMPL_

CASNO	Target Analyte	Sample Result	Samp Qual	MS Result	MS Qual	Reporting Limit	Spike Added	MS % Rec.	Control Limits
7429-90-5	ALUMINUM	120	C	4720		100	5000	92	75 - 125%
7440-47-3	CHROMIUM	14		484		10	500	94	75 - 125%
7440-48-4	COBALT	0.27	B	95.6		5	100	95	75 - 125%
7440-50-8	COPPER	1.1	U	983		8	1000	98	75 - 125%
7439-96-5	MANGANESE	0.96	B	96.4		5	100	95	75 - 125%
7439-98-7	MOLYBDENUM	5.2		99.4		2	100	94	75 - 125%
7440-02-0	NICKEL	4.2	U	474		20	500	95	75 - 125%
7782-49-2	SELENIUM	3.6	B	103		10	100	99	75 - 125%
7440-61-1	URANIUM	83		93.6		0.1	10	110	75 - 125%
7440-66-6	ZINC	9.1	U	1930		100	2000	97	75 - 125%

Data Package ID: *im1607144-1*

7/20/2016
ALS1607144

ICPMS Metals

Method SW6020A

Matrix Spike And Matrix Spike Duplicate

Lab Name: ALS Environmental -- FC

Work Order Number: 1607144

Client Name: CH2M HILL Plateau Remediation Company

ClientProject ID: 200W Pump & Treat - Treatment Plant Water Sampling F15-

Field ID: B35730

LabID: 1607144-2MSD

Sample Matrix: WATER

% Moisture: N/A

Date Collected: 27-May-16

Date Extracted: 12-Jul-16

Date Analyzed: 13-Jul-16

Prep Method: SW3005 Rev A

Prep Batch: IP160712-2

QCBatchID: IP160712-2-3

Run ID: IM160713-11A17

Cleanup: NONE

Basis: As Received

Sample Aliquot: 50 ml

Final Volume: 50 ml

Result Units: UG/L

File Name: 095SMPL_

CASNO	Target Analyte	MSD Result	MSD Qual	Spike Added	MSD % Rec.	Reporting Limit	RPD Limit	RPD
7429-90-5	ALUMINUM	4790		5000	93	100	20	2
7440-47-3	CHROMIUM	482		500	94	10	20	0
7440-48-4	COBALT	94.6		100	94	5	20	1
7440-50-8	COPPER	974		1000	97	8	20	1
7439-96-5	MANGANESE	95.2		100	94	5	20	1
7439-98-7	MOLYBDENUM	98.3		100	93	2	20	1
7440-02-0	NICKEL	469		500	94	20	20	1
7782-49-2	SELENIUM	98.2		100	95	10	20	5
7440-61-1	URANIUM	93.1		10	104	0.1	20	1
7440-66-6	ZINC	1900		2000	95	100	20	2

Data Package ID: *im1607144-1*