

## Appendix 1: Site photos and summary information for Yellowstone gas and water samples.

Bergfeld, Deborah, Lowenstern, J.B., Hunt, A.G., Shanks, W.C.P., III, and Evans, W.C., 2014, Gas and isotope chemistry of thermal features in Yellowstone National Park, Wyoming (ver. 1.1, September 2014): U.S. Geological Survey Scientific Investigations Report 2011-5012, 28 p., and data files, <http://dx.doi.org/10.3133/sir20115012>.

Sample: Alpha-numeric codes begin with YL and are followed by a two digit year code (03 for 2003, for example), a hyphen, and a sample number for that year.

Location: Informal name for the sampled feature. The name could be a defined thermal feature or could indicate simply that the sample was taken in the same general location. When we sampled an actual thermal feature denoted in the Yellowstone Thermal Features database (<http://www.rcn.montana.edu/Features/Search.aspx>), we list the name of that feature in the “YNP Thermal Features Database” column in table 2.

Date: Date sampled in Month/Day/Year format.

Easting: East-west location in Universal Transverse Mercator (UTM) coordinate system: Zone 12. Datum is NAD 83 (nearly identical to WGS 84). Units are in meters. Uncertainties are generally ~3 m.

Northing: East-west location in Universal Transverse Mercator (UTM) coordinate system: Zone 12. Datum is NAD 83 (nearly identical to WGS 84). Units are in meters. Uncertainties are generally ~3 m

Type: Split into three types of features: 1) fum (fumarole), 2) fry (frying pan) and pool (pools and springs). Some fumaroles may be steaming ground or sub-boiling gas seeps.

Group: One of twenty groups defined for the purpose of explication and plot generation. Except for group 1 (Miscellaneous) and group 11 (Eastern Yellowstone) samples in a group are generally closely located. The groups shown below are also described and categorized in table 1.

Temperature: Temperature in degrees Celsius. Temperature can be reproducibly measured to within 0.1°C, but accuracy may be limited to ~0.5°C due to temperature variability within the feature, and instrumental variations.

Xg%: Mole percent gas relative to gas plus steam. A sample with no steam would have a value of 100 (for example, typically pools have higher Xg because the steam condenses as it bubbles through the water). The value for a gas-free sample would approach zero. Our expected accuracy is 10% relative; that is, an Xg of 10 should be between 9 and 11 mol% gas.

R/Ra:  $^3\text{He}/^4\text{He}$  ratio of sample divided by that in air ( $1.399 \times 10^{-6}$ ) and corrected for any air that may have been mixed into the sample.



Sample	YL03-01A
Location	Lone_Star
Date	9/4/2003
Easting	515429
Northing	4918413
Type	fry
Group	15
Temperature (°C)	94.0
Xg%	0.11%
R/Ra	7.37



<b>Sample</b>	<b>YL03-02A</b>
Location	Fountain_Paint_Pot
Date	9/5/2003
Easting	515386
Northing	4933083
Type	fum
Group	3
Temperature (°C)	111.1
Xg%	0.48%
R/Ra	6.13



<b>Sample</b>	<b>YL03-03A</b>
Location	Black_Sands1
Date	9/5/2003
Easting	511542
Northing	4923256
Type	fry
Group	15
Temperature (°C)	92.2
Xg%	0.50%
R/Ra	

<b>Sample</b>	<b>YL03-04A</b>
Location	Black_Sands2
Date	9/5/2003
Easting	511628
Northing	4923190
Type	pool
Group	15
Temperature (°C)	76.1
Xg%	82.36%
R/Ra	



Sample	YL03-05B
Location	Near_DB
Date	9/6/2003
Easting	523215
Northing	4952111
Type	fum
Group	8
Temperature (°C)	94.7
Xg%	0.05%
R/Ra	7.17



Sample	YL03-06B
Location	Green_Dragon
Date	9/6/2003
Easting	523196
Northing	4952111
Type	pool
Group	8
Temperature (°C)	88.6
Xg%	37.69%
R/Ra	



<b>Sample</b>	<b>YL03-07A</b>
Location	Son_of_Green_Dragon
Date	9/6/2003
Easting	523208
Northing	4952035
Type	fum
Group	8
Temperature (°C)	94.1
Xg%	0.15%
R/Ra	7.04



<b>Sample</b>	<b>YL03-08A</b>
Location	Dishwater
Date	9/6/2003
Easting	523384
Northing	4952086
Type	pool
Group	8
Temperature (°C)	89.4
Xg%	9.37%
R/Ra	



<b>Sample</b>	<b>YL03-09B</b>
Location	Beryl_Spring
Date	9/7/2003
Easting	520088
Northing	4947298
Type	fum
Group	18
Temperature (°C)	99.6
Xg%	1.10%
R/Ra	12.40



Sample	YL03-10B
Location	Black_Growler
Date	9/7/2003
Easting	523502
Northing	4952278
Type	fum
Group	8
Temperature (°C)	93.6
Xg%	0.30%
R/Ra	7.35

<b>Sample</b>	<b>YL03-11B</b>
Location	Black_Pit
Date	9/7/2003
Easting	523588
Northing	4952139
Type	pool
Group	8
Temperature (°C)	82.3
Xg%	80.48%
R/Ra	



Sample	YL03-12A
Location	Porcelain_Terrace1
Date	9/7/2003
Easting	523746
Northing	4953112
Type	fum
Group	8
Temperature (°C)	93.9
Xg%	1.01%
R/Ra	



Sample	YL03-13A
Location	Nymph_Lake_new_feature
Date	9/4/2004
Easting	521471
Northing	4955495
Type	fum
Group	17
Temperature (°C)	93.6
Xg%	0.93%
R/Ra	4.94



<b>Sample</b>	<b>YL03-14B</b>
Location	Terrace_Springs
Date	9/8/2003
Easting	512184
Northing	4944102
Type	pool
Group	7
Temperature (°C)	63.3
Xg%	86.56%
R/Ra	7.93



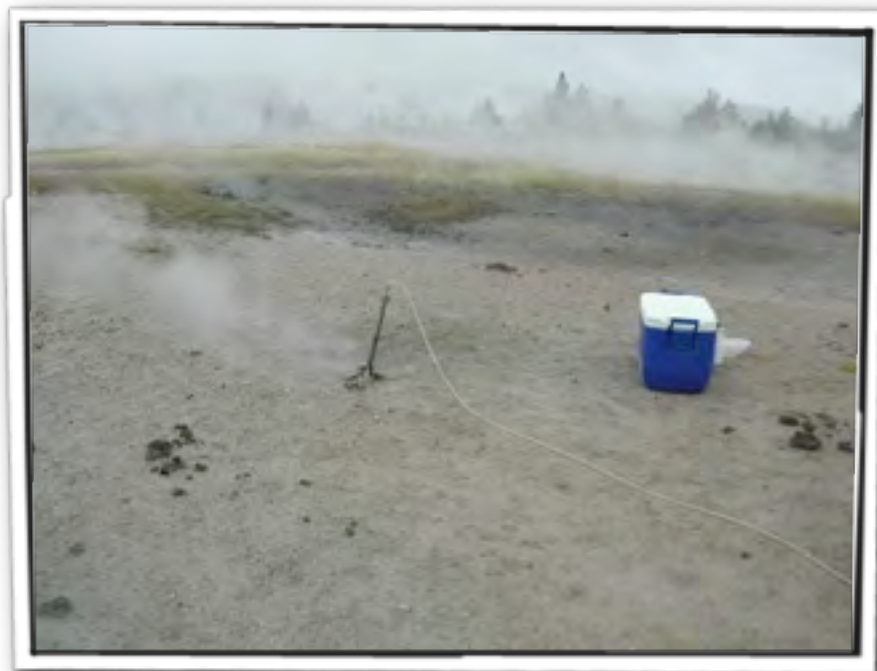


Sample	YL03-15A
Location	W_Nymph_Lake_Thermal_Area1
Date	9/9/2003
Easting	520335
Northing	44954609
Type	pool
Group	17
Temperature (°C)	82.0
Xg%	43.63%
R/Ra	6.32





Sample	YL03-016A
Location	W_Nymph_Lake_Thermal_Area2
Date	9/9/2003
Easting	520244
Northing	4954683
Type	fry
Group	17
Temperature (°C)	92.0
Xg%	2.82%
R/Ra	6.26



Sample	YL03-017A
Location	Conoco
Date	9/10/2003
Easting	513205
Northing	4922954
Type	fum
Group	15
Temperature (°C)	94.5
Xg%	0.20%
R/Ra	7.82



<b>Sample</b>	<b>YL03-18A</b>
Location	Smokejumper1
Date	9/12/2003
Easting	503793
Northing	4917530
Type	pool
Group	12
Temperature (°C)	85.0
Xg%	75.46%
R/Ra	



Sample	YL03-19A
Location	Smokejumper2
Date	9/12/2003
Easting	503260
Northing	4918509
Type	fum
Group	12
Temperature (°C)	92.1
Xg%	0.47%
R/Ra	5.50



Sample	YL03-20
Location	Smokejumper3
Date	9/12/2003
Easting	503273
Northing	4918792
Type	fum
Group	12
Temperature (°C)	92.1
Xg%	0.36%
R/Ra	



Sample	YL03-21A
Location	Smokejumper4
Date	9/12/2003
Easting	503559
Northing	4918096
Type	fry
Group	12
Temperature (°C)	92.1
Xg%	0.29%
R/Ra	5.64





<b>Sample</b>	<b>YL04-01</b>
Location	Black_Pit
Date	9/13/2004
Easting	523588
Northing	4952139
Type	fum
Group	8
Temperature (°C)	92.6
Xg%	0.68%
R/Ra	



Sample	YL04-02
Location	nr_Gibbon_R1
Date	9/13/2004
Easting	523658
Northing	4954007
Type	pool
Group	8
Temperature (°C)	84
Xg%	4.69%
R/Ra	





Sample	YL04-03
Location	nr_Gibbon_R2
Date	9/13/2004
Easting	523680
Northing	4954101
Type	fry
Group	8
Temperature (°C)	72.8
Xg%	93.32%
R/Ra	



<b>Sample</b>	<b>YL04-04</b>
Location	Nymph_Lake_new_feature
Date	9/13/2004
Easting	521444
Northing	4955530
Type	fry
Group	17
Temperature (°C)	93
Xg%	1.20%
R/Ra	4.75



<b>Sample</b>	<b>YL04-05</b>
Location	Conoco
Date	9/14/2004
Easting	513182
Northing	4922973
Type	fum
Group	15
Temperature (°C)	94.3
Xg%	0.20%
R/Ra	7.45



<b>Sample</b>	<b>YL04-06</b>
Location	Bison_Kill
Date	9/14/2004
Easting	523471
Northing	4954042
Type	pool
Group	8
Temperature (°C)	8.5
Xg%	61.44%
R/Ra	3.28



Sample	YL04-07
Location	Bison_Flat1
Date	9/14/2004
Easting	523527
Northing	4953778
Type	fum
Group	8
Temperature (°C)	92.9
Xg%	2.90%
R/Ra	



Sample	YL04-08
Location	Back_Basin1
Date	9/15/2004
Easting	523182
Northing	4952090
Type	fum
Group	8
Temperature (°C)	
Xg%	0.21%
R/Ra	





<b>Sample</b>	<b>YL04-09</b>
Location	Back_Basin2
Date	9/15/2004
Easting	522963
Northing	4952193
Type	pool
Group	8
Temperature (°C)	67.4
Xg%	91.75%
R/Ra	7.81



Sample	YL04-10
Location	Green_Dragon
Date	9/15/2004
Easting	523194
Northing	4951894
Type	pool
Group	8
Temperature (°C)	76.8
Xg%	3.06%
R/Ra	





Sample	YL04-11
Location	Steamboat_mud_volcano
Date	9/15/2004
Easting	523502
Northing	4952272
Type	fum
Group	8
Temperature (°C)	92.8
Xg%	0.56%
R/Ra	



Sample	YL04-12
Location	Porcelain_Terrace2
Date	9/15/2004
Easting	523732
Northing	4953033
Type	fum
Group	8
Temperature (°C)	92.6
Xg%	1.05%
R/Ra	4.48



Sample	YL04-13
Location	Hundred_Springs_Plain
Date	9/15/2004
Easting	523113
Northing	4953330
Type	pool
Group	8
Temperature (°C)	89.1
Xg%	23.28%
R/Ra	6.22



Sample	YL04-14
Location	Beryl_Spring
Date	9/16/2004
Easting	520093
Northing	4947311
Type	fum
Group	18
Temperature (°C)	93.1
Xg%	0.76%
R/Ra	12.13



Sample	YL04-15
Location	Devils_Den
Date	9/16/2004
Easting	549077
Northing	4971336
Type	fum
Group	1
Temperature (°C)	27.2
Xg%	89.33%
R/Ra	0.84





Sample	YL04-17
Location	Sylvan_Springs1
Date	9/17/2004
Easting	517878
Northing	4949941
Type	pool
Group	18
Temperature (°C)	22.4
Xg%	87.33%
R/Ra	7.32



<b>Sample</b>	<b>YL04-19</b>
Location	Sylvan_Springs2
Date	9/17/2004
Easting	518326
Northing	4949582
Type	fum
Group	18
Temperature (°C)	97.8
Xg%	6.53%
R/Ra	7.14





<b>Sample</b>	<b>YL04-20</b>
Location	Sylvan_Springs3
Date	9/17/2004
Easting	518326
Northing	4949582
Type	fry
Group	18
Temperature (°C)	91.9
Xg%	3.86%
R/Ra	



Sample	YL04-21
Location	Gas_Vents_Norris_Canyon_Rd
Date	9/18/2004
Easting	535329
Northing	4951004
Type	fum
Group	10
Temperature (°C)	92.1
Xg%	1.52%
R/Ra	5.08



Sample	YL04-22
Location	Artist_Paintpot
Date	9/18/2004
Easting	520838
Northing	4948760
Type	fry
Group	18
Temperature (°C)	91.7
Xg%	0.16%
R/Ra	10.40



<b>Sample</b>	<b>YL05-01</b>
Location	Black_Pit
Date	9/13/2005
Easting	523589
Northing	4952144
Type	fum
Group	8
Temperature (°C)	91.9
Xg%	0.92%
R/Ra	6.48

<b>Sample</b>	<b>YL05-02</b>
Location	Terrace_Springs
Date	9/13/2005
Easting	512184
Northing	4944102
Type	pool
Group	7
Temperature (°C)	62.3
Xg%	54.98
R/Ra	



<b>Sample</b>	<b>YL05-03</b>
Location	Frying_Pan_Spring
Date	9/14/2005
Easting	521979
Northing	4955476
Type	fry
Group	17
Temperature (°C)	91.8
Xg%	1.53%
R/Ra	





Sample	YL05-04
Location	Gibbon_River_Bridge
Date	9/14/2005
Easting	520295
Northing	4947980
Type	fum
Group	18
Temperature (°C)	93.4
Xg%	2.96%
R/Ra	12.15



<b>Sample</b>	<b>YL05-05</b>
Location	Conoco
Date	9/14/2005
Easting	513181
Northing	4922972
Type	fum
Group	15
Temperature (°C)	92.5
Xg%	0.18
R/Ra	



Sample	YL05-06
Location	Back_Basin3
Date	9/15/2005
Easting	523170
Northing	4952046
Type	fum
Group	8
Temperature (°C)	92.6
Xg%	0.09
R/Ra	7.31



Sample	YL05-07
Location	Back_Basin4
Date	9/15/2005
Easting	523011
Northing	4952171
Type	pool
Group	8
Temperature (°C)	87.4
Xg%	82.18
R/Ra	



Sample	YL05-08
Location	Black_Growler
Date	9/15/2005
Easting	523496
Northing	4952728
Type	fum
Group	8
Temperature (°C)	93.6
Xg%	0.53%
R/Ra	





Sample	YL05-09
Location	Bison_Flat2
Date	9/16/2005
Easting	523538
Northing	4953830
Type	fum
Group	8
Temperature (°C)	93.9
Xg%	1.68
R/Ra	





Sample	YL05-10
Location	Nymph_Lake_new_feature
Date	9/16/2005
Easting	521456
Northing	4955507
Type	fum
Group	17
Temperature (°C)	93.5
Xg%	2.65
R/Ra	4.71



Sample	YL05-11
Location	Chocolate_Pots
Date	9/16/2005
Easting	520496
Northing	4950780
Type	pool
Group	18
Temperature (°C)	52.5
Xg%	93.14
R/Ra	



Sample	YL05-12
Location	Sulfur_Cauldron1
Date	9/17/2005
Easting	544992
Northing	4941758
Type	pool
Group	14
Temperature (°C)	68.9
Xg%	93.51
R/Ra	14.98



Sample	YL05-13, 13A
Location	Mud_Geyser
Date	9/17/2005
Easting	545055
Northing	4941205
Type	fum
Group	14
Temperature (°C)	112.9
Xg%	10.65, 14.04
R/Ra	15.29



Sample	YL05-14
Location	Roaring_Mountain1
Date	9/19/2005
Easting	520861
Northing	4958599
Type	fum
Group	6
Temperature (°C)	92.7
Xg%	2.91
R/Ra	1.87





Sample	YL05-15
Location	Narrow_Gauge
Date	9/19/2005
Easting	522880
Northing	4979593
Type	pool
Group	4
Temperature (°C)	74.8
Xg%	96.12
R/Ra	





Sample	YL05-17a,b
Location	Quagmire
Date	9/21/2005
Easting	515413
Northing	4934949
Type	fry
Group	3
Temperature (°C)	93.4
Xg%	0.12%, 0.13%
R/Ra	3.48



Sample	YL05-18A,B,C,D
Location	Gibbon_River_Bridge
Date	9/21/2005
Easting	520295
Northing	4947980
Type	fum
Group	18
Temperature (°C)	93.2
Xg%	2.59, 2.23, 2.33, 2.28
R/Ra	



<b>Sample</b>	<b>YL06-01A</b>
Location	HSB1
Date	8/27/2006
Easting	558800
Northing	4954767
Type	fum
Group	11
Temperature (°C)	91.9
Xg%	1.44%
R/Ra	5.52



Sample	YL06-02
Location	HSB2
Date	8/29/2006
Easting	558553
Northing	4953761
Type	fry
Group	11
Temperature (°C)	91.9
Xg%	81.80%
R/Ra	6.73



<b>Sample</b>	<b>YL06-03</b>
Location	HSB3
Date	8/29/2006
Easting	558752
Northing	4954838
Type	fum
Group	11
Temperature (°C)	91.4
Xg%	2.43%
R/Ra	





Sample	YL06-04
Location	HSB4
Date	8/29/2006
Easting	5588890
Northing	4955349
Type	fum
Group	11
Temperature (°C)	93.4
Xg%	3.69%
R/Ra	5.10





<b>Sample</b>	<b>YL06-05</b>
Location	HSB5
Date	8/29/2006
Easting	558925
Northing	4955398
Type	pool
Group	11
Temperature (°C)	76.9
Xg%	88.06%
R/Ra	



Sample	YL06-06
Location	HSB6
Date	8/30/2006
Easting	559263
Northing	4954529
Type	fry
Group	11
Temperature (°C)	90.1
Xg%	0.74%
R/Ra	5.67



Sample	YL06-07
Location	HSB7
Date	8/30/2006
Easting	560345
Northing	4954787
Type	fum
Group	11
Temperature (°C)	90.9
Xg%	0.70%
R/Ra	4.63



<b>Sample</b>	<b>YL06-08A</b>
Location	HSB8
Date	8/30/2006
Easting	559347
Northing	4954788
Type	pool
Group	11
Temperature (°C)	68.1
Xg%	97.23%
R/Ra	



Sample	YL06-09
Location	Black_Pit
Date	9/01/2006
Easting	523589
Northing	4952144
Type	fum
Group	8
Temperature (°C)	94.5
Xg%	0.44%
R/Ra	





Sample	YL06-10
Location	Back_Basin5
Date	9/01/2006
Easting	523155
Northing	4952043
Type	fum
Group	8
Temperature (°C)	92.1
Xg%	0.21%
R/Ra	





<b>Sample</b>	<b>YL06-11</b>
Location	Guardian
Date	9/01/2006
Easting	523477
Northing	4952724
Type	fum
Group	8
Temperature (°C)	92.5
Xg%	0.56%
R/Ra	7.43



Sample	YL06-12
Location	Behind_Congress
Date	9/01/2006
Easting	523655
Northing	4952727
Type	pool
Group	8
Temperature (°C)	92.7
Xg%	0.22%
R/Ra	



Sample	YL07-01
Location	Gas_Vents-Norris-Canyon_Rd
Date	9/12/2007
Easting	535328
Northing	4951009
Type	fum
Group	10
Temperature (°C)	91.1
Xg%	1.79%
R/Ra	



Sample	YL07-02
Location	Sulphur_Cauldron
Date	9/12/2007
Easting	544961
Northing	4941790
Type	fum
Group	14
Temperature (°C)	98.2
Xg%	11.11%
R/Ra	15.29



Sample	YL07-03
Location	Mud_Geyser
Date	9/12/2007
Easting	545055
Northing	4941202
Type	fum
Group	14
Temperature (°C)	114.7
Xg%	9.46%
R/Ra	16.49





<b>Sample</b>	<b>YL07-04</b>
Location	Behind_Inkpot
Date	9/13/2007
Easting	545106
Northing	4956992
Type	fum
Group	2
Temperature (°C)	92.4
Xg%	2.31%
R/Ra	4.91





Sample	YL07-05
Location	Washburn
Date	9/13/2007
Easting	545135
Northing	4957173
Type	fum
Group	2
Temperature (°C)	93.2
Xg%	1.73%
R/Ra	4.78



<b>Sample</b>	<b>YL07-06</b>
Location	Pocket_Basin
Date	9/14/2007
Easting	513979
Northing	4934350
Type	fum
Group	3
Temperature (°C)	93.7
Xg%	0.15%
R/Ra	2.95

<b>Sample</b>	<b>YL07-09</b>
Location	Guardian
Date	9/15/2007
Easting	523477
Northing	4952724
Type	fum
Group	8
Temperature (°C)	92.1
Xg%	0.32%
R/Ra	



<b>Sample</b>	<b>YL07-10</b>
Location	Steamvalve
Date	9/15/2007
Easting	523494
Northing	4952561
Type	pool
Group	8
Temperature (°C)	68.8
Xg%	87.45%
R/Ra	8.79



<b>Sample</b>	<b>YL07-11</b>
Location	Bison_Flat
Date	9/15/2007
Easting	523548
Northing	4953837
Type	fum
Group	8
Temperature (°C)	92.1
Xg%	1.27%
R/Ra	



Sample	YL07-12
Location	Roaring_Mountain2
Date	9/16/2007
Easting	520703
Northing	4958588
Type	fum
Group	6
Temperature (°C)	92.4
Xg%	0.46%
R/Ra	





Sample	YL07-13
Location	Mud_Geyser
Date	9/16/2007
Easting	545055
Northing	4941202
Type	fum
Group	14
Temperature (°C)	-
Xg%	8.70%
R/Ra	



<b>Sample</b>	<b>YL07-14</b>
Location	Fountain_Paint_Pot
Date	9/17/2007
Easting	515376
Northing	4933087
Type	fum
Group	3
Temperature (°C)	92.0
Xg%	0.22%
R/Ra	6.07



Sample	YL07-15
Location	Beryl_Spring
Date	9/17/2007
Easting	520077
Northing	4947298
Type	fum
Group	18
Temperature (°C)	92.5
Xg%	0.79%
R/Ra	12.22



Sample	YL07-17
Location	Crater_Hills
Date	9/18/2007
Easting	541392
Northing	4944637
Type	fum
Group	1
Temperature (°C)	90.9
Xg%	2.98%
R/Ra	10.37



Sample	YL07-18.1 and 2
Location	Devils_Den
Date	9/18/2007
Easting	549070
Northing	4971350
Type	fum
Group	1
Temperature (°C)	23.7
Xg%	85.94%, 74.45
R/Ra	



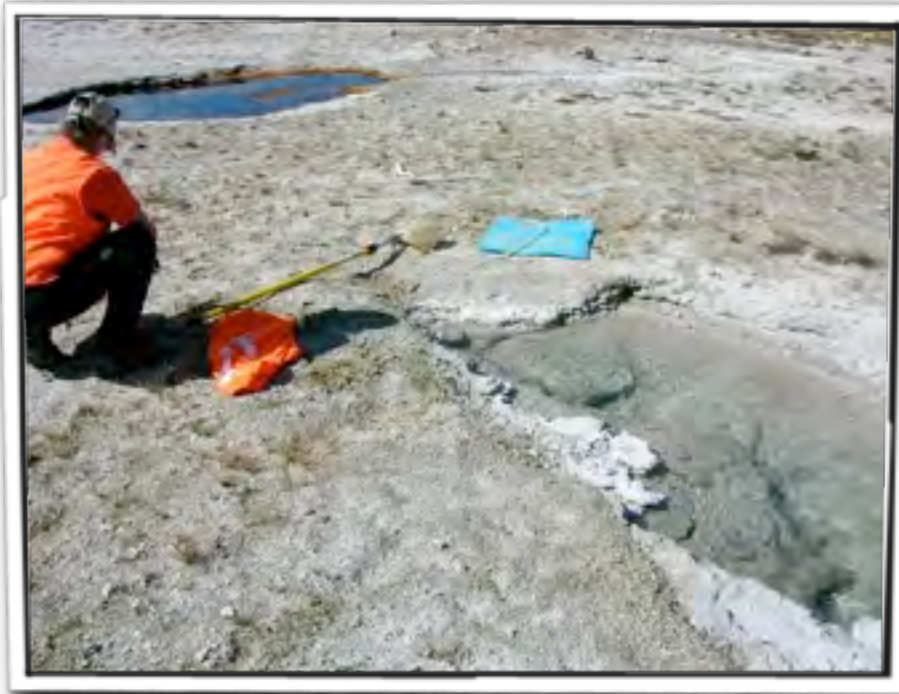


Sample	YL08-02
Location	Steamboat_Point
Date	9/17/2008
Easting	555848
Northing	4930907
Type	fum
Group	11
Temperature (°C)	93.4
Xg%	0.21%
R/Ra	0.76

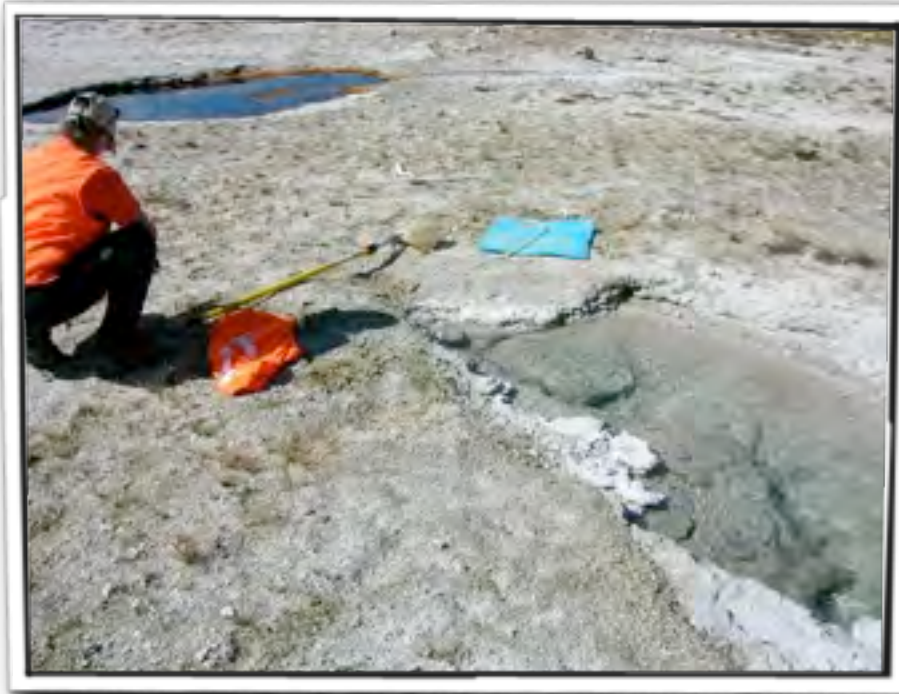




<b>Sample</b>	<b>YL08-03</b>
Location	Potts_Basin1
Date	9/17/2008
Easting	533421
Northing	4919761
Type	pool
Group	13
Temperature (°C)	68.8
Xg%	81.4%
R/Ra	



Sample	YL08-04
Location	Potts_Basin2
Date	9/17/2008
Easting	533505
Northing	4919689
Type	pool
Group	13
Temperature (°C)	87.5
Xg%	43.8%
R/Ra	4.73



Sample	YL08-04b
Location	Potts_Basin_2A
Date	9/17/2008
Easting	533505
Northing	4919689
Type	pool
Group	13
Temperature (°C)	87.5
Xg%	43.8%
R/Ra	



<b>Sample</b>	<b>YL08-05</b>
Location	Potts_Basin3
Date	9/17/2008
Easting	533504
Northing	4919547
Type	pool
Group	13
Temperature (°C)	45.3
Xg%	98.1%
R/Ra	





<b>Sample</b>	<b>YL08-07</b>
Location	Snake_River_HS1
Date	9/18/2008
Easting	527133
Northing	4887672
Type	pool
Group	1
Temperature (°C)	81.4
Xg%	87.4%
R/Ra	



<b>Sample</b>	<b>YL08-08</b>
Location	Conoco
Date	9/18/2008
Easting	513195
Northing	4922978
Type	fum
Group	1
Temperature (°C)	93.5
Xg%	0.15%
R/Ra	





Sample	YL08-09
Location	Forest_Springs1
Date	9/19/2008
Easting	541730
Northing	4950841
Type	fry
Group	5
Temperature (°C)	91
Xg%	3.49%
R/Ra	11.65



Sample	YL08-10
Location	Forest_Springs2
Date	9/19/2008
Easting	541609
Northing	4951154
Type	fry
Group	5
Temperature (°C)	87.6
Xg%	3.80%
R/Ra	11.93



Sample	YL08-11
Location	Ochre_Spring
Date	9/19/2008
Easting	547154
Northing	4939408
Type	fum
Group	1
Temperature (°C)	91.7
Xg%	2.48%
R/Ra	12.19



Sample	YL08-12
Location	Poison_Spring
Date	9/20/2008
Easting	522543
Northing	4979039
Type	pool
Group	4
Temperature (°C)	39.3
Xg%	89.7%
R/Ra	7.74



Sample	YL08-13
Location	Amphitheater_Springs
Date	9/20/2008
Easting	521782
Northing	4960436
Type	fry
Group	6
Temperature (°C)	88.3
Xg%	1.8%
R/Ra	





Sample	YL08-14
Location	Obsidian_Pool_fry
Date	9/21/2008
Easting	544411
Northing	4939629
Type	fry
Group	14
Temperature (°C)	90.2
Xg%	10.9%
R/Ra	16.28





Sample	YL08-14b
Location	Obsidian_Pool_fry
Date	9/21/2008
Easting	544411
Northing	4939629
Type	fry
Group	14
Temperature (°C)	90.2
Xg%	10.33%
R/Ra	



Sample	YL08-15
Location	Obsidian_Pool
Date	9/21/2008
Easting	544530
Northing	4939794
Type	pool
Group	14
Temperature (°C)	89.2
Xg%	9.24%
R/Ra	



<b>Sample</b>	<b>YL08-16</b>
Location	Back_Basin6
Date	9/21/2008
Easting	523119
Northing	4952036
Type	fum
Group	8
Temperature (°C)	93.7
Xg%	0.11%
R/Ra	7.30



<b>Sample</b>	<b>YL08-17</b>
Location	Steamvalve
Date	9/21/2008
Easting	523494
Northing	4952561
Type	pool
Group	8
Temperature (°C)	71.4
Xg%	83.8%
R/Ra	



Sample	YL08-18
Location	Brimstone1
Date	9/25/2008
Easting	562143
Northing	4915346
Type	pool
Group	9
Temperature (°C)	6.6
Xg%	75.0%
R/Ra	3.03





Sample	YL08-19
Location	Brimstone2
Date	9/25/2008
Easting	562447
Northing	4914975
Type	pool
Group	9
Temperature (°C)	16.3
Xg%	79.7%
R/Ra	2.99





Sample	YL08-20
Location	Brimstone3
Date	9/25/2008
Easting	562447
Northing	4914975
Type	pool
Group	9
Temperature (°C)	n.d.
Xg%	83.1%
R/Ra	



Sample	YL09-01
Location	Conoco
Date	9/08/2009
Easting	513263
Northing	4922738
Type	fum
Group	15
Temperature (°C)	93.3
Xg%	0.08%
R/Ra	6.30



Sample	YL09-02
Location	Black_Sands1
Date	9/08/2009
Easting	511600
Northing	4923050
Type	pool
Group	10
Temperature (°C)	90.0
Xg%	0.90%
R/Ra	8.10



Sample	YL09-03A,B
Location	Gas_Vents-Norris-Canyon_Rd
Date	9/08/2009
Easting	535384
Northing	4950801
Type	fum
Group	10
Temperature (°C)	92.9
Xg%	1.65, 1.71%
R/Ra	4.55



Sample	YL09-04
Location	Frying_Pan_Spring
Date	9/09/2009
Easting	521972
Northing	455470
Type	fry
Group	17
Temperature (°C)	92.3
Xg%	1.59%
R/Ra	5.65





<b>Sample</b>	<b>YL09-05</b>
Location	Heart_Middle
Date	9/11/2009
Easting	538509
Northing	4904911
Type	pool
Group	16
Temperature (°C)	89.9
Xg%	3.91%
R/Ra	1.21



Sample	YL09-06
Location	Heart_Fissure
Date	9/11/2009
Easting	538237
Northing	4905600
Type	fum
Group	16
Temperature (°C)	92.9
Xg%	0.18%
R/Ra	1.14



<b>Sample</b>	<b>YL09-07b</b>
Location	Heart_Lower
Date	9/11/2009
Easting	539402
Northing	4904193
Type	pool
Group	16
Temperature (°C)	84
Xg%	62.27%
R/Ra	





Sample	YL09-08
Location	Heart_Rustic
Date	9/11/2009
Easting	539387
Northing	4903042
Type	fum
Group	16
Temperature (°C)	93.0
Xg%	0.06%
R/Ra	1.09



<b>Sample</b>	<b>YL09-09</b>
Location	Heart_North
Date	9/12/2009
Easting	537996
Northing	4906463
Type	fum
Group	16
Temperature (°C)	92.9
Xg%	0.30%
R/Ra	1.81





Sample	YL09-10
Location	Heart_White_Gulch
Date	9/12/2009
Easting	537312
Northing	4906184
Type	fum
Group	16
Temperature (°C)	92.7
Xg%	0.38%
R/Ra	2.70



<b>Sample</b>	<b>YL09-11</b>
Location	Heart_Upper
Date	9/12/2009
Easting	537625
Northing	4905810
Type	fry
Group	16
Temperature (°C)	92.0
Xg%	0.17%
R/Ra	2.94



Sample	YL09-12
Location	Heart_Rustic
Date	9/12/2009
Easting	539387
Northing	4903042
Type	fum
Group	3
Temperature (°C)	93.4
Xg%	0.06%
R/Ra	





Sample	YL09-13
Location	Rabbit_Creek
Date	9/15/2009
Easting	515167
Northing	4929582
Type	fum
Group	3
Temperature (°C)	93.2
Xg%	0.06%
R/Ra	8.82



<b>Sample</b>	<b>YL09-14</b>
Location	Quagmire
Date	9/15/2009
Easting	515479
Northing	4934737
Type	fum
Group	3
Temperature (°C)	93.5
Xg%	0.18%
R/Ra	





Sample	YL09-15
Location	Terrace_Springs
Date	9/15/2009
Easting	512183
Northing	4944102
Type	pool
Group	7
Temperature (°C)	63.3
Xg%	98.97%
R/Ra	



Sample	YL09-16
Location	Turbid_Lake_Upper
Date	9/16/2009
Easting	558972
Northing	4932326
Type	fum
Group	11
Temperature (°C)	91.1
Xg%	5.79%
R/Ra	4.02



Sample	YL09-17
Location	Bear_Creek
Date	9/16/2009
Easting	558879
Northing	4932647
Type	pool
Group	11
Temperature (°C)	92.3
Xg%	4.57%
R/Ra	4.23



Sample	YL09-18
Location	Pelican_Creek_Trail
Date	9/16/2009
Easting	557089
Northing	4935393
Type	pool
Group	11
Temperature (°C)	6.7
Xg%	83.6%
R/Ra	2.41





Sample	YL11-02
Location	Conoco
Date	9/09/2011
Easting	513199
Northing	4922960
Type	fum
Group	15
Temperature (°C)	93.9
Xg%	0.17%
R/Ra	7.60





Sample	YL11-03
Location	Mud_Geyser
Date	9/10/2011
Easting	545054
Northing	4941203
Type	fum
Group	14
Temperature (°C)	113.4
Xg%	12%
R/Ra	15.96



Sample	YL11-04
Location	Back_Basin6
Date	9/10/2011
Easting	523119
Northing	4952036
Type	fum
Group	8
Temperature (°C)	93.2
Xg%	0.15%
R/Ra	7.10



Sample	YL11-05
Location	Steamboat_mud_volcano
Date	9/10/2011
Easting	523502
Northing	4952272
Type	fum
Group	8
Temperature (°C)	93.6
Xg%	1.40%
R/Ra	



Sample	YL11-06
Location	Gibbon_River_Bridge
Date	9/10/2011
Easting	520295
Northing	4947980
Type	fum
Group	18
Temperature (°C)	94.1
Xg%	2.10%
R/Ra	12.26



<b>Sample</b>	<b>YL11-07</b>
Location	Shoshone_01
Date	9/12/2011
Easting	516273
Northing	4911441
Type	fum
Group	19
Temperature (°C)	92.6
Xg%	0.23
R/Ra	4.20





Sample	YL11-08
Location	Shoshone_02
Date	9/12/2011
Easting	516451
Northing	4911476
Type	fry
Group	19
Temperature (°C)	83.2
Xg%	
R/Ra	



Sample	YL11-09
Location	Shoshone_13
Date	9/12/2011
Easting	516361
Northing	4911273
Type	pool
Group	19
Temperature (°C)	93.0
Xg%	
R/Ra	



Sample	YL11-10
Location	Shoshone_14
Date	9/12/2011
Easting	516430
Northing	4911320
Type	pool
Group	19
Temperature (°C)	86.5
Xg%	
R/Ra	



Sample	YL11-11
Location	Shoshone_03
Date	9/12/2011
Easting	516447
Northing	4911596
Type	pool
Group	19
Temperature (°C)	86.5
Xg%	87.0%
R/Ra	7.49

<b>Sample</b>	<b>YL11-12</b>
Location	Shoshone_19
Date	9/13/2011
Easting	516019
Northing	4910663
Type	hot spring, flowing
Group	19
Temperature (°C)	91.0
Xg%	
R/Ra	





Sample	YL11-13
Location	Shoshone_04
Date	9/13/2011
Easting	516153
Northing	4911145
Type	fum
Group	19
Temperature (°C)	92.8
Xg%	0.44%
R/Ra	7.91



Sample	YL11-13w
Location	Shoshone_04 (nr)
Date	9/13/2011
Easting	516142
Northing	4911145
Type	fry
Group	19
Temperature (°C)	86.5
Xg%	
R/Ra	



Sample	YL11-14
Location	Shoshone_05
Date	9/13/2011
Easting	516308
Northing	4911063
Type	fum
Group	19
Temperature (°C)	92.7
Xg%	0.23%
R/Ra	3.18

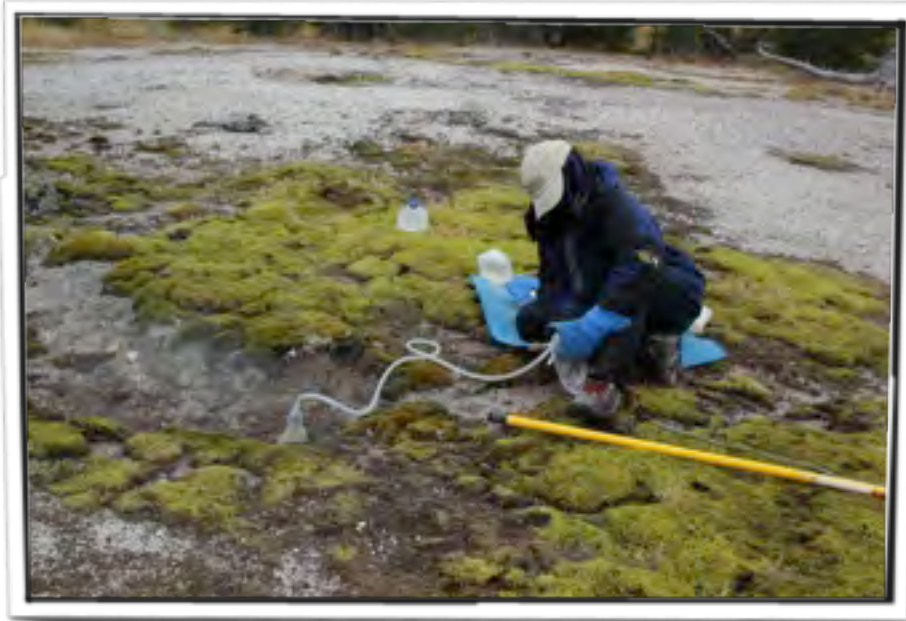


Sample	YL11-15
Location	Shoshone_06
Date	9/13/2011
Easting	516224
Northing	4911474
Type	fum
Group	19
Temperature (°C)	94.7
Xg%	0.32%
R/Ra	7.58



Sample	YL11-15w
Location	Shoshone_11 (near)
Date	9/13/2011
Easting	516196
Northing	4911471
Type	pool
Group	19
Temperature (°C)	86.2
Xg%	
R/Ra	





Sample	YL11-16
Location	Shoshone_07
Date	9/14/2011
Easting	515879
Northing	4911472
Type	fum
Group	19
Temperature (°C)	91.6
Xg%	0.20%
R/Ra	8.59



Sample	YL11-17
Location	Shoshone_08
Date	9/14/2011
Easting	515863
Northing	4911232
Type	pool
Group	19
Temperature (°C)	87.6
Xg%	39.0%
R/Ra	8.92



Sample	YL11-18
Location	Shoshone_09
Date	9/14/2011
Easting	515954
Northing	4910960
Type	pool
Group	19
Temperature (°C)	76.5
Xg%	63.0%
R/Ra	8.60



Sample	YL11-19
Location	Shoshone_10
Date	9/14/2011
Easting	516121
Northing	4911400
Type	pool
Group	19
Temperature (°C)	85.2
Xg%	77.0%
R/Ra	8.66



Sample	YL11-20
Location	Taurus_Spring
Date	9/13/2011
Easting	516029
Northing	4911098
Type	pool
Group	19
Temperature (°C)	94.4
Xg%	
R/Ra	





Sample	YL11-21
Location	Gourd_Spring
Date	9/13/2011
Easting	516070
Northing	4911320
Type	pool
Group	19
Temperature (°C)	92.8
Xg%	
R/Ra	



Sample	YL11-22
Location	Shoshone_15
Date	9/13/2011
Easting	516113
Northing	4911366
Type	pool
Group	19
Temperature (°C)	93.3
Xg%	
R/Ra	



Sample	YL11-23
Location	Shoshone_20
Date	9/13/2011
Easting	520051
Northing	4912754
Type	Lake
Group	19
Temperature (°C)	17.0
Xg%	
R/Ra	



Sample	YL11-27
Location	Shoshone_11
Date	9/15/2011
Easting	516196
Northing	4911471
Type	pool
Group	19
Temperature (°C)	84.9
Xg%	91.0%
R/Ra	



Sample	YL11-28
Location	Coral_Spring
Date	9/15/2011
Easting	515779
Northing	4911112
Type	pool
Group	19
Temperature (°C)	80.7
Xg%	
R/Ra	





Sample	YL11-29
Location	Shoshone_08
Date	9/15/2011
Easting	515863
Northing	4911232
Type	pool
Group	19
Temperature (°C)	88.0
Xg%	
R/Ra	

<b>Sample</b>	<b>YL11-30</b>
Location	Shoshone_18
Date	9/14/2011
Easting	516000
Northing	4912504
Type	creek
Group	19
Temperature (°C)	13.3
Xg%	
R/Ra	



Sample	YL11-31
Location	Shoshone_12
Date	9/15/2011
Easting	516277
Northing	4911554
Type	fum
Group	19
Temperature (°C)	92.3
Xg%	0.43%
R/Ra	



Sample	YL11-SCD
Location	Shoshone_16
Date	9/14/2011
Easting	516066
Northing	4910752
Type	creek
Group	19
Temperature (°C)	20.0
Xg%	
R/Ra	

<b>Sample</b>	<b>YL11-SCU</b>
Location	Shoshone_17
Date	9/14/2011
Easting	515831
Northing	4912474
Type	creek
Group	19
Temperature (°C)	13.6
Xg%	
R/Ra	





Sample	YL12-01
Location	Gas_Vents_Norris_Canyon_Rd
Date	7/10/2012
Easting	535355
Northing	4950974
Type	fum
Group	10
Temperature (°C)	92.4
Xg%	1.20%
R/Ra	5.14



Sample	YL12-02
Location	Mary Bay
Date	7/11/2012
Easting	555264
Northing	4933613
Type	fry
Group	11
Temperature (°C)	92.9
Xg%	0.52%
R/Ra	4.75



Sample	YL12-03
Location	Butte Springs
Date	7/11/2012
Easting	557460
Northing	4929966
Type	fry
Group	11
Temperature (°C)	95.1
Xg%	0.06%
R/Ra	



<b>Sample</b>	<b>YL12-04</b>
Location	Cinder Pool
Date	7/14/2012
Easting	522980
Northing	4953269
Type	pool
Group	8
Temperature (°C)	84.2
Xg%	13.0%
R/Ra	



Sample	YL12-05
Location	Amphitheater_Springs
Date	7/15/2012
Easting	521490
Northing	4960810
Type	fum
Group	6
Temperature (°C)	~92
Xg%	0.90%
R/Ra	





Sample	YL12-06
Location	Helen's Cool Pool
Date	7/25/2012
Easting	545673
Northing	4941001
Type	pool
Group	14
Temperature (°C)	23.2
Xg%	
R/Ra	16.43



Sample	YL12-07
Location	Monument Fumarole
Date	9/06/2012
Easting	519532
Northing	4947894
Type	fum
Group	18
Temperature (°C)	114.2
Xg%	4.3%
R/Ra	12.31

<b>Sample</b>	<b>YL12-08</b>
Location	Monument Frying Pan
Date	9/06/2012
Easting	519507
Northing	4947902
Type	fry
Group	18
Temperature (°C)	90.7
Xg%	
R/Ra	



Sample	YL12-09
Location	Highland #1
Date	9/08/2012
Easting	530167
Northing	4939875
Type	fum
Group	20
Temperature (°C)	90.8
Xg%	0.80%
R/Ra	8.45



Sample	YL12-10
Location	Highland #2
Date	9/08/2012
Easting	530298
Northing	4939495
Type	fum
Group	20
Temperature (°C)	91.5
Xg%	0.06%
R/Ra	8.47





Sample	YL12-11
Location	Highland #3
Date	9/09/2012
Easting	530540
Northing	4939141
Type	fum
Group	20
Temperature (°C)	92.5
Xg%	0.16%
R/Ra	7.62



Sample	YL12-12
Location	Pool Highland Basin
Date	9/09/2012
Easting	530483
Northing	4939260
Type	pool
Group	20
Temperature (°C)	77.7
Xg%	
R/Ra	



Sample	YL12-13
Location	Muddy Pool Highland Basin
Date	9/09/2012
Easting	530491
Northing	4939253
Type	pool
Group	20
Temperature (°C)	89.1
Xg%	
R/Ra	



Sample	YL12-14
Location	Highland #4
Date	9/09/2012
Easting	530698
Northing	4938710
Type	fum
Group	20
Temperature (°C)	92.3
Xg%	0.30%
R/Ra	8.03



Sample	YL12-15
Location	Highland #5
Date	9/09/2012
Easting	530716
Northing	4938613
Type	fum
Group	20
Temperature (°C)	92.3
Xg%	0.30%
R/Ra	5.17





Sample	YL12-16
Location	Nez Perce Creek
Date	9/11/2012
Easting	523264
Northing	4937794
Type	creek
Group	
Temperature (°C)	13.7
Xg%	
R/Ra	



Sample	YL12-17
Location	Spruce Creek
Date	9/11/2012
Easting	523240
Northing	4937756
Type	creek
Group	
Temperature (°C)	21.5
Xg%	
R/Ra	



Sample	YL12-19
Location	Nymph_Lake_new_feature
Date	9/13/2012
Easting	521452
Northing	4955523
Type	fum
Group	17
Temperature (°C)	92.7
Xg%	2.1%
R/Ra	



Sample	YL12-20
Location	Nymph frying pan
Date	9/13/2012
Easting	521481
Northing	4955449
Type	fry
Group	17
Temperature (°C)	91.4
Xg%	1.9%
R/Ra	



Sample	YL12-21
Location	Obsidian Creek Pool
Date	9/13/2012
Easting	520644
Northing	4959557
Type	pool
Group	6
Temperature (°C)	68.8
Xg%	
R/Ra	





Sample	YL12-22
Location	Gibbon_River_Bridge
Date	9/13/2012
Easting	520295
Northing	4947980
Type	fum
Group	18
Temperature (°C)	93.3
Xg%	2.3%
R/Ra	



Sample	YL12-23
Location	Ebro Hot Spring
Date	9/14/2012
Easting	552358
Northing	4937398
Type	hot spring, flowing
Group	11
Temperature (°C)	57.9
Xg%	
R/Ra	



Sample	YL12-24
Location	Sulfur Hills Fumarole #1
Date	9/14/2012
Easting	553792
Northing	4938184
Type	fum
Group	1
Temperature (°C)	103.4
Xg%	0.24%
R/Ra	7.48



Sample	YL12-25
Location	Sulfur Hills Fumarole #2
Date	9/14/2012
Easting	554027
Northing	4938193
Type	fum
Group	1
Temperature (°C)	114.3
Xg%	0.17%
R/Ra	6.97