

Reviewing and Understanding Analytical Reports

Melonie Sutton, TestAmerica Valparaiso

Keith Henley, A & L Great Lakes Laboratories

John Rigdon, Sherry Labs

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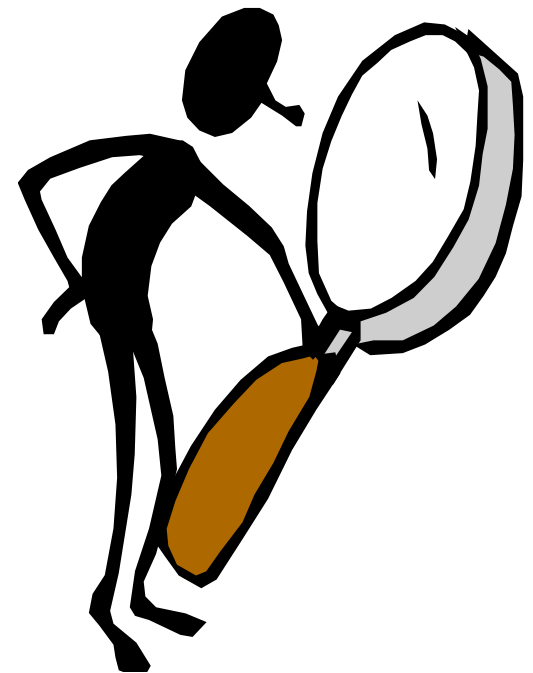
Top 6 Ways to Make Your Project Run Smoothly

1. Choose the Right Lab for the Job
2. Call Ahead to Set Up Your Project
3. Complete Chain-of-Custody (COC) Thoroughly and Correctly
4. Be Aware of Short Hold Time Analyses and Transport Samples to the Lab ASAP
5. Read Report in a Timely Manner
6. Understand How the QA/QC Procedures Affect Your Sample Results

Choosing Your Laboratory

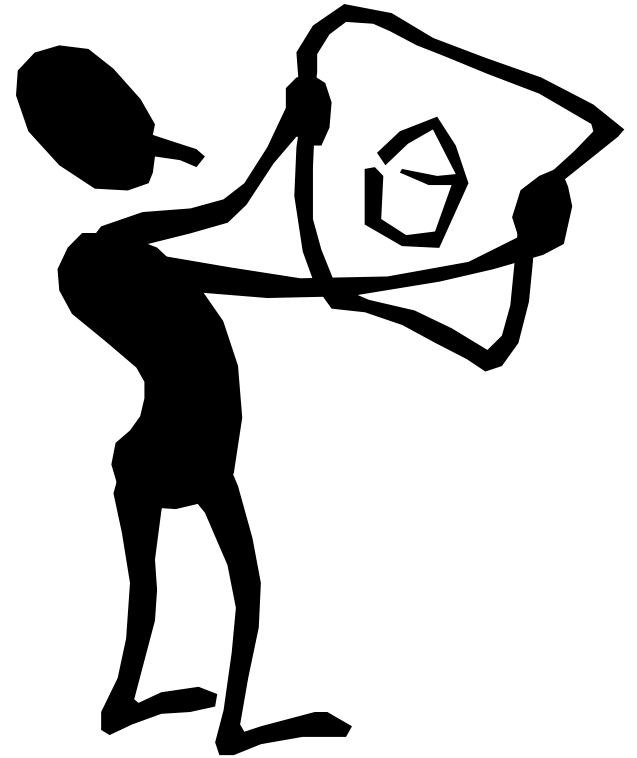
What to Look For...

- Laboratory Certifications
- Performance Test (PT) Scores
- Lab Audit Reports/Findings
- Report Deliverable Capabilities
- Customer Service / Responsiveness
- Turnaround Time Capabilities
- Education/Experience/Technical Knowledge
- Ability to Meet Project Data Quality Objectives (Methods, RLs)
- Added Value/Cost
- On-Line Data Management Capabilities



Setting Up Your Project

- Get to Know Your Project Manager - They are Your Ally
- Know What Analyses You Need
- Give Ample Time for your Laboratory to Prepare Bottles and Courier
- Communicate Specific Project Objectives with the Lab



Relationship

- Lab & client work together to develop the scope
- Client should advise lab on regulatory drivers/data end use and the lab should advise client of capabilities to meet requirements
- Client is responsible for final decisions and direction
- Single point of contact for both parties minimizes confusion, miscommunications and wasted time
- Good idea for lab to provide written quote that restates requirements for final clarification
- Project kick-off meetings suggested for larger, more complex projects.

Communicating Project Specifics Is Key to Success

- Regulatory Driver/Data End Use
 - Under 327 Indiana Administrative Code (IAC) 6.1
- Sampling Plan
- Permit or Program
- # of samples
- Matrices
- Contaminants of concern
- Analyses / Compound lists
 - Know what analyses you need
- Reporting limits/ Regulatory action limits
- Methodology
- Turn-around Time (TAT)
- Certifications
- Report deliverables
- Electronic Data Deliverables (EDDs)
- Web Access to Data
- QC (Lab, Field)
- Field schedule - start/duration
- Sample batching & arrival
- Holding times
- Bottle requirements – preservatives & volumes
- Courier services – from site or office – date/time
- Pricing & payment terms
- Invoicing requirements

Potential Pitfalls

- Bottle Prep Time Pressure
 - Potential errors in proper bottles & preservatives
 - Potential for insufficient volume
- TAT
 - When does clock start?
 - Is TAT calculated in business days or calendar days?
 - When is preliminary data available vs hardcopy data?
 - Standard TAT – what is it?
- Missed Holding Times
- Missed Reporting Limits
- Dilutions/Moisture Content/Matrix Interferences & Resulting Impact on RLs
- Wrong data deliverable

Consequences

- Project Objectives Not Met
- Increase in Cost
- Time Delays
 - In the lab
 - In the field
- Reputation
 - Potential fall-out w/ perceptions to client or about lab

Filling Out the COC

- Record All Field Information (Sample ID, Sample Dates and Times, Sample Type, Sample Matrix, etc.)
- Client Name & Address
- Project Name & PO Number
- Project Manager & Sampler
- Phone & Fax Numbers, E-mail Address
- Required Analyses
- Turn-Around Time (TAT)
- Make sure all special requests have been communicated to the lab
- Hazards
- Relinquish Signature, Date & Time

Filling Out the COC

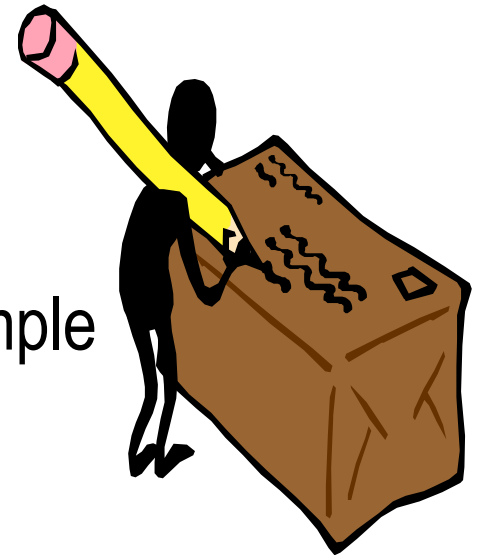
- It is the client's responsibility to accurately complete the COC
- The COC is a legal document
- Use impermeable ink - This protects against smearing and fading if the COC becomes wet
- Avoid over-writes and strike-outs
- If a correction is needed, use a single line strike and date and initial the correction
- Each field on a COC represents important project information - completing as much as possible is helpful to the laboratory & alleviates delays.

Short Hold Time Analyses

Asbestos	48 Hours
BOD	48 Hours
Fecal Coliform Bacteria	24 Hours
Ferrous Iron	48 Hours
Moisture (%solids)	7 Days
Nitrate / Nitrite	48 Hours
pH	Immediate
SOUR	2 Hours
Surfactants (MBAS)	48 Hours
Temperature	Immediate
Turbidity	48 Hours

Packaging & Shipment

- Courier or Shipping?
- 24 Hr. Min. Advance Notice for Courier
- From On-Site Location or Office?
- Samples Iced to Keep Temperature at $4^{\circ} \text{C} \pm 2^{\circ} \text{C}$
- Avoid Blue Ice – may not maintain sample temperature
- Package Samples Carefully To Prevent Sample Breakage in Transit
- Coolers are Sealed with Custody Seals



Let's look at the Laboratory Final Report...and some (problem) Example Reports



Reviewing the Report

- Is the data reported as wet or dry weight?
- Were appropriate reporting and detection limits used?
- Do values for metals, PCB or fecal bacteria exceed land application limits?
- Were holding times met?
- Do any values look unusually high or low? Have you contacted the laboratory in a timely manner to verify results?
- Are methods referenced?

Reviewing the Report, cont...

- Was the chain of custody completed properly?
- Was enough sample provided for each analysis?
- Has the report been reviewed in timely manner?
- Were all requested analysis completed?
- Are issues associated with sample non-conformance documented?

Understand the Report Format from your Laboratory



Lab Number: 79671

Sample ID: 4TH QTR.

REPORT OF ANALYSIS

Date Sampled: 1/3/2011 07:10

Date Received: 01/04/2011

Date Reported: 01/13/2011

Page: 2 of 5

Parameter	Wet Basis			Dry Basis		Table 1 [#]	Table 3 [#]	Loading Rate		Analyst	Date Analyzed	Method Reference
	Result	Unit	MRL	Result	Unit	mg/kg	mg/kg	Lbs/Wet Ton	Lbs/Dry Ton			
pH	12.47		---			---	---			CRT	01/05/11	SW846-9045D
Temperature at time of pH	18.3	deg. C	0.1			---	---			CRT	01/05/11	SW846-9045C
Nitrogen, Total	3201	mg/kg	1	0.37	%	---	---	6.40	7.3	MG	01/06/11	SM(20th)-4500N(org)B,N
Nitrogen, Total Kjeldahl	3199	mg/kg	1	0.37	%	---	---	6.40	7.3	MG	01/06/11	SM(20th)-4500 N(org)B a
Nitrogen, Ammonia (as N)	37	mg/kg	1	0.0042	%	---	---	0.074	0.085	MG	01/10/11	SM(20th)-4500-NH3B,C
Nitrogen, Nitrate (as N)	2	mg/kg	1	0.00023	%	---	---	0.0040	0.0046	RH	01/07/11	EPA-353.2 mod
Phosphorus	3446.2	mg/kg	13.2	0.39	%	---	---	6.89	7.9	CC	01/06/11	SW846-6010B
Phosphorus (as P2O5)	7892	mg/kg	---	0.90	%	---	---	15.78	18.1	CC	01/06/11	Calculated
Potassium	1614.5	mg/kg	22.4	0.18	%	---	---	3.23	3.7	CC	01/06/11	SW846-6010B
Potassium (as K2O)	1937	mg/kg	---	0.22	%	---	---	3.87	4.4	CC	01/06/11	Calculated
Arsenic	25.12	mg/kg	0.12	28.7	mg/kg	75	41	0.050	0.057	CC	01/05/11	SW846-6020
Cadmium	0.31	mg/kg	0.18	0.35	mg/kg	85	39	0.00062	0.00071	CC	01/05/11	SW846-6020
Copper	45.24	mg/kg	0.30	51.7	mg/kg	4300	1500	0.090	0.10	CC	01/05/11	SW846-6020
Lead	7.53	mg/kg	0.86	8.61	mg/kg	840	300	0.015	0.017	CC	01/05/11	SW846-6020

Table 1 and Table 3 pollution concentrations for biosolids or industrial waste products, EPA-600/4-79-020, 327 IAC 6.1-5.

* Plant Available Nitrogen (PAN) calculations assume incorporation or injection with no prior year contribution of mineralized N.

Example Report Format from Sherry Laboratory

Analytical Report

(wastewater)

WO#: 11022702

Date Reported: 3/3/2011

CLIENT: Collection Date: 2/28/2011 7:00:00 AM
 Project: Example Report #1 Biosolids
 Lab ID: 11022702-001 Matrix: SLUDGE
 Client Sample ID: Example #1
 Sample Location: Sites 1-7 Comp

Analyses	Result	RL	Qual	Units	DF	PL	Date Analyzed
503 SLUDGE AMMONIA AS N IN SLUDGE				M4500-NH3 BD			Analyst: VJP
Nitrogen, Ammonia (As N)	525	5.00		mg/Kg	1		3/3/2011 10:53:06 AM
503 SLUDGE NITRATE IN SLUDGE				E353.2			Analyst: VJP
Nitrogen, Nitrate-Nitrite	6.4	0.5		mg/Kg	5		3/1/2011 1:45:00 PM
503 SLUDGE SOLIDS, TOTAL				M2540 G			Analyst: VJP
Percent Solids	5.50	0.10		wt%	1		3/3/2011 10:28:56 AM
503 SLUDGE TOTAL PHOSPHORUS				M4500-P E			Analyst: VJP
Total Phosphorus	2.200	110		mg/kg	1		3/2/2011 9:30:00 AM
503 SLUDGE TOTAL KJELDAHL NITROGEN IN SOLIDS				M4500-NORG			Analyst: VJP
Nitrogen, Kjeldahl, Total	1.800	800		mg/Kg	100		3/3/2011 11:00:19 AM
PCBS IN SOIL OR SOLID WASTE				SW8082			Analyst: SUB
Aroclor 1016	< 0.10	0.10		mg/Kg	1		3/3/2011 1:22:23 PM
Aroclor 1221	< 0.10	0.10		mg/Kg	1		3/3/2011 1:22:23 PM
Aroclor 1232	< 0.10	0.10		mg/Kg	1		3/3/2011 1:22:23 PM
Aroclor 1242	< 0.10	0.10		mg/Kg	1		3/3/2011 1:22:23 PM
Aroclor 1248	< 0.10	0.10		mg/Kg	1		3/3/2011 1:22:23 PM
Aroclor 1254	< 0.10	0.10		mg/Kg	1		3/3/2011 1:22:23 PM
Aroclor 1260	< 0.10	0.10		mg/Kg	1		3/3/2011 1:22:23 PM
Surr: Decachlorobiphenyl	0	30-130	S	%REC	1		3/3/2011 1:22:23 PM
503 SLUDGE METALS IN SOIL OR SLUDGE BY ICP				SW6010B			Analyst: VJP
Arsenic	0.147	0.100		mg/Kg	1		3/3/2011 2:24:43 PM

Example Report Format from TestAmerica Laboratory

Client Sample ID: Biosolids

Date Collected: 11/01/10 05:26

Date Received: 11/01/10 10:50

Lab Sample ID: 510-58508-1

Matrix: Solid

Percent Solids: 13.6

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	8.3		3.6		mg/Kg	☼	11/04/10 10:29	11/16/10 20:10	5
Arsenic	1.1		0.49		mg/Kg		11/04/10 10:29	11/16/10 20:10	5
Cadmium	<1.8		1.8		mg/Kg	☼	11/04/10 10:29	11/16/10 02:00	5
Cadmium	<0.25		0.25		mg/Kg		11/04/10 10:29	11/16/10 02:00	5
Copper	870		3.6		mg/Kg	☼	11/04/10 10:29	11/24/10 14:33	5
Copper	120		0.49		mg/Kg		11/04/10 10:29	11/24/10 14:33	5
Lead	31		0.80		mg/Kg	☼	11/04/10 10:29	11/22/10 21:11	5
Lead	4.3		0.12		mg/Kg		11/04/10 10:29	11/22/10 21:11	5
Molybdenum	16		2.7		mg/Kg	☼	11/04/10 10:29	11/16/10 20:10	5
Molybdenum	2.2		0.37		mg/Kg		11/04/10 10:29	11/16/10 20:10	5
Nickel	85		1.8		mg/Kg	☼	11/04/10 10:29	11/16/10 02:00	5
Nickel	12		0.25		mg/Kg		11/04/10 10:29	11/16/10 02:00	5
Potassium	1500		540		mg/Kg	☼	11/04/10 10:29	11/16/10 20:10	5
Potassium	210		74		mg/Kg		11/04/10 10:29	11/16/10 20:10	5
Selenium	8.4		1.8		mg/Kg	☼	11/04/10 10:29	11/16/10 02:00	5
Selenium	1.1		0.25		mg/Kg		11/04/10 10:29	11/16/10 02:00	5
Zinc	960		15		mg/Kg	☼	11/04/10 10:29	11/29/10 13:45	5
Zinc	130		2.0		mg/Kg		11/04/10 10:29	11/29/10 13:45	5

Example Report # 1

Lab Number: 78195
Sample ID: CITY

REPORT OF ANALYSIS

Date Sampled: 11/29/2010

Date Received: 12/01/2010

Date Reported: 12/03/2010

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Parameter	Wet Basis			Dry Basis		Table 1 [#]	Table 3 [#]	Loading Rate		Analyst	Date Analyzed	Method Reference
	Result	Unit	MRL	Result	Unit	mg/kg	mg/kg	Lbs/Wet Ton	Lbs/Dry Ton			
Arsenic	1.16	mg/kg	0.03	27.0	mg/kg	75	41	0.0023	0.054	CC	12/02/10	SW846-6020
Cadmium	0.17	mg/kg	0.05	3.95	mg/kg	85	39	0.00034	0.0079	CC	12/02/10	SW846-6020
Copper	30.62	mg/kg	0.08	712	mg/kg	4300	1500	0.061	1.4	CC	12/02/10	SW846-6020
Lead	5.70	mg/kg	0.22	133	mg/kg	840	300	0.011	0.27	CC	12/02/10	SW846-6020
Mercury	<0.10	mg/kg	0.10	<2.3	mg/kg	57	17	<0.0002	<0.0047	CC	12/03/10	SW846-6020
Molybdenum	1.24	mg/kg	0.19	28.8	mg/kg	75	---	0.0025	0.058	CC	12/02/10	SW846-6020
Nickel	1.32	mg/kg	0.04	30.7	mg/kg	420	420	0.0026	0.061	CC	12/02/10	SW846-6020
Selenium	0.32	mg/kg	0.03	7.44	mg/kg	100	100	0.00064	0.015	CC	12/03/10	SW846-6020
Zinc	37.71	mg/kg	0.33	877	mg/kg	7500	2800	0.075	1.8	CC	12/03/10	SW846-6020
Solids, Total	4.30	%	0.01	100.0	%	---	---	86.0	2000.0	MG	12/01/10	SM(20th)-2540G
PCB, Total	<0.04	mg/kg	0.04	<0.93	mg/kg	---	---	<0.00008	<0.0019	SKP	12/02/10	SW846-8082
Sample Digestion-Microwave						---	---			EC	12/02/10	SW846-3051

Table 4.5

Detection Limits (dry weight)

1. Arsenic, 2 mg/kg
2. Mercury, 2 mg/kg
3. Selenium, 2 mg/kg
4. Cadmium, 10 mg/kg
5. Lead, 10 mg/kg
6. Molybdenum, 10 mg/kg
7. Nickel, 10 mg/kg

Reference 327 IAC 6.1, page 21

Example Report # 2

Lab Number: 79838

Sample ID: COMPOSITE

REPORT OF ANALYSIS

Date Sampled: 1/4/2011

Date Received: 01/05/2011

Date Reported: 01/07/2011

Page: 2 of 3

Parameter	Wet Basis			Dry Basis		Table 1 [#]	Table 3 [#]	Loading Rate		Analyst	Date Analyzed	Method Reference
	Result	Unit	MRL	Result	Unit	mg/kg	mg/kg	Lbs/Wet Ton	Lbs/Dry Ton			
Nitrogen, Total	9136	mg/kg	1	5.45	%	---	---	18.27	109.0	MG	01/06/11	SM(20th)-4500N(org)B,N
Nitrogen, Total Kjeldahl	9136	mg/kg	1	5.45	%	---	---	18.27	109.0	MG	01/06/11	SM(20th)-4500 N(org)B a
Nitrogen, Ammonia (as N)	1798	mg/kg	1	1.07	%	---	---	3.60	21.4	MG	01/06/11	SM(20th)-4500-NH3B,C
Nitrogen, Nitrate (as N)	< 1	mg/kg	1	<0.00060	%	---	---	<0.002	<0.012	RH	01/07/11	EPA-353.2 mod
Phosphorus	2886.5	mg/kg	13.2	1.72	%	---	---	5.77	34.4	MM	01/07/11	SW846-6010B
Phosphorus (as P2O5)	6610	mg/kg	---	3.94	%	---	---	13.22	78.8	MM	01/07/11	Calculated
Potassium	471.4	mg/kg	22.4	0.28	%	---	---	0.94	5.6	MM	01/07/11	SW846-6010B
Potassium (as K2O)	566	mg/kg	---	0.34	%	---	---	1.13	6.7	MM	01/07/11	Calculated
Arsenic	0.70	mg/kg	0.12	4.17	mg/kg	75	41	0.0014	0.0083	CC	01/06/11	SW846-6020
Cadmium	<0.18	mg/kg	0.18	<1.1	mg/kg	85	39	<0.0004	<0.0021	CC	01/06/11	SW846-6020
Copper	72.33	mg/kg	0.30	431	mg/kg	4300	1500	0.14	0.86	CC	01/06/11	SW846-6020
Lead	4.37	mg/kg	0.86	26.1	mg/kg	840	300	0.0087	0.052	CC	01/06/11	SW846-6020
Mercury	0.07	mg/kg	0.05	0.42	mg/kg	57	17	0.00014	0.00082	CC	01/07/11	SW846-6020
Molybdenum	13.10	mg/kg	0.75	x 78.1	mg/kg	75	---	0.026	0.16	CC	01/06/11	SW846-6020

[#] Table 1 and Table 3 pollution concentrations for hazardous inorganic waste products. EPA 820/4-70-020, 827-140-04, 5

Example Report # 4

REPORT OF ANALYSIS

DATE RECEIVED: 1/13/2011 09:45

DATE REPORTED: 1/14/2011 PAGE: 2 of 2

LAB NUMBER	DATE SAMPLED	SAMPLE ID	PARAMETER	RESULT	UNIT	REPORTING LIMIT	ANALYST	ANALYSIS DATE	METHOD REFERENCE
80210	1/12/2011 1/12/2011	1	Solids, Total Fecal Coliform	17.45 600000	% CFU/g dry	0.01 1	MG MG	1/13/2011 1/13/2011	SM(20th)-2540G SM(20th)-9222D
80211	1/12/2011 1/12/2011	2	Solids, Total Fecal Coliform	17.84 4500000	% CFU/g dry	0.01 1	MG MG	1/13/2011 1/13/2011	SM(20th)-2540G SM(20th)-9222D
80212	1/12/2011 1/12/2011	3	Solids, Total Fecal Coliform	17.77 1200000	% CFU/g dry	0.01 1	MG MG	1/13/2011 1/13/2011	SM(20th)-2540G SM(20th)-9222D
80213	1/12/2011 1/12/2011	4	Solids, Total Fecal Coliform	16.86 1200000	% CFU/g dry	0.01 1	MG MG	1/13/2011 1/13/2011	SM(20th)-2540G SM(20th)-9222D
80214	1/12/2011 1/12/2011	5	Solids, Total Fecal Coliform	18.04 5000000	% CFU/g dry	0.01 1	MG MG	1/13/2011 1/13/2011	SM(20th)-2540G SM(20th)-9222D
80215	1/12/2011 1/12/2011	6	Solids, Total Fecal Coliform	16.89 4200000	% CFU/g dry	0.01 1	MG MG	1/13/2011 1/13/2011	SM(20th)-2540G SM(20th)-9222D
80216	1/12/2011 1/12/2011	7	Solids, Total Fecal Coliform	16.58 4900000	% CFU/g dry	0.01 1	MG MG	1/13/2011 1/13/2011	SM(20th)-2540G SM(20th)-9222D

The Geometric Mean for Fecal Coliform Density = 2900000 CFU/1.0g dry.

Example Report # 5

REPORT OF ANALYSIS

DATE RECEIVED: 1/13/2011 10:53

DATE REPORTED: 1/14/2011 PAGE: 2 of 3

LAB NUMBER	DATE SAMPLED	SAMPLE ID	PARAMETER	RESULT	UNIT	REPORTING LIMIT	ANALYST	ANALYSIS DATE	METHOD REFERENCE
80245	1/11/2011 08:00	1	Solids, Total	30.83	%	0.01	MG	1/13/2011	SM(20th)-2540G
	1/11/2011 08:00		Fecal Coliform	10000	CFU/g dry	1	MG	1/13/2011	SM(20th)-9222D
80246	1/11/2011 08:00	2	Solids, Total	23.00	%	0.01	MG	1/13/2011	SM(20th)-2540G
	1/11/2011 08:00		Fecal Coliform	66000	CFU/g dry	1	MG	1/13/2011	SM(20th)-9222D
80247	1/11/2011 08:00	3	Solids, Total	30.43	%	0.01	MG	1/13/2011	SM(20th)-2540G
	1/11/2011 08:00		Fecal Coliform	30000	CFU/g dry	1	MG	1/14/2011	SM(20th)-9222D
80248	1/11/2011 08:00	4	Solids, Total	38.54	%	0.01	MG	1/13/2011	SM(20th)-2540G
	1/11/2011 08:00		Fecal Coliform	26000	CFU/g dry	1	MG	1/14/2011	SM(20th)-9222D
80249	1/11/2011 08:15	5	Solids, Total	20.36	%	0.01	MG	1/13/2011	SM(20th)-2540G
	1/11/2011 08:15		Fecal Coliform	5000	CFU/g dry	1	MG	1/14/2011	SM(20th)-9222D
80250	1/11/2011 08:15	6	Solids, Total	17.24	%	0.01	MG	1/13/2011	SM(20th)-2540G

Example Report # 6

REPORT OF ANALYSIS

Date Sampled: 12/18/2010

Date Received: 01/18/2011

Date Reported: 01/21/2011

Page: 2 of 3

Lab Number: 80390

Sample ID: COMPOSITE

Parameter	Wet Basis			Dry Basis		Table 1 [#]	Table 3 [#]	Loading Rate		Analyst	Date Analyzed	Method Reference
	Result	Unit	MRL	Result	Unit	mg/kg	mg/kg	Lbs/Wet Ton	Lbs/Dry Ton			
Nitrogen, Total	8914	mg/kg	1	5.40	%	---	---	17.83	107.9	MG	01/20/11	SM(20th)-4500N(org)B,N
Nitrogen, Total Kjeldahl	8907	mg/kg	1	5.39	%	---	---	17.81	107.8	MG	01/20/11	SM(20th)-4500 N(org)B a
Nitrogen, Ammonia (as N)	1452	mg/kg	1	0.88	%	---	---	2.90	17.6	MG	01/20/11	SM(20th)-4500-NH3B,C
Nitrogen, Nitrate (as N)	7	mg/kg	1	0.0042	%	---	---	0.014	0.085	RH	01/21/11	EPA-353.2 mod
Phosphorus	3920.8	mg/kg	13.2	2.37	%	---	---	7.84	47.5	CC	01/20/11	SW846-6010B
Phosphorus (as P2O5)	8979	mg/kg	---	5.44	%	---	---	17.96	108.7	CC	01/20/11	Calculated
Potassium	531.0	mg/kg	22.4	0.32	%	---	---	1.06	6.4	CC	01/20/11	SW846-6010B
Potassium (as K2O)	637	mg/kg	---	0.39	%	---	---	1.27	7.7	CC	01/20/11	Calculated
Arsenic	1.16	mg/kg	0.26	7.02	mg/kg	75	41	0.0023	0.014	CC	01/19/11	SW846-6020
Cadmium	<0.22	mg/kg	0.22	<1.3	mg/kg	85	39	<0.0004	<0.0027	CC	01/19/11	SW846-6020
Copper	98.35	mg/kg	0.96	595	mg/kg	4300	1500	0.20	1.2	CC	01/19/11	SW846-6020
Lead	3.80	mg/kg	0.60	23.0	mg/kg	840	300	0.0076	0.046	CC	01/19/11	SW846-6020
Mercury	<0.24	mg/kg	0.24	<1.5	mg/kg	57	17	<0.0005	<0.0029	CC	01/19/11	SW846-6020
Molybdenum	4.54	mg/kg	0.43	27.5	mg/kg	75	---	0.0091	0.055	CC	01/19/11	SW846-6020

Evaluating Your Test Results



Numbers – Good or Bad??????

<2 mg/kg dry wt

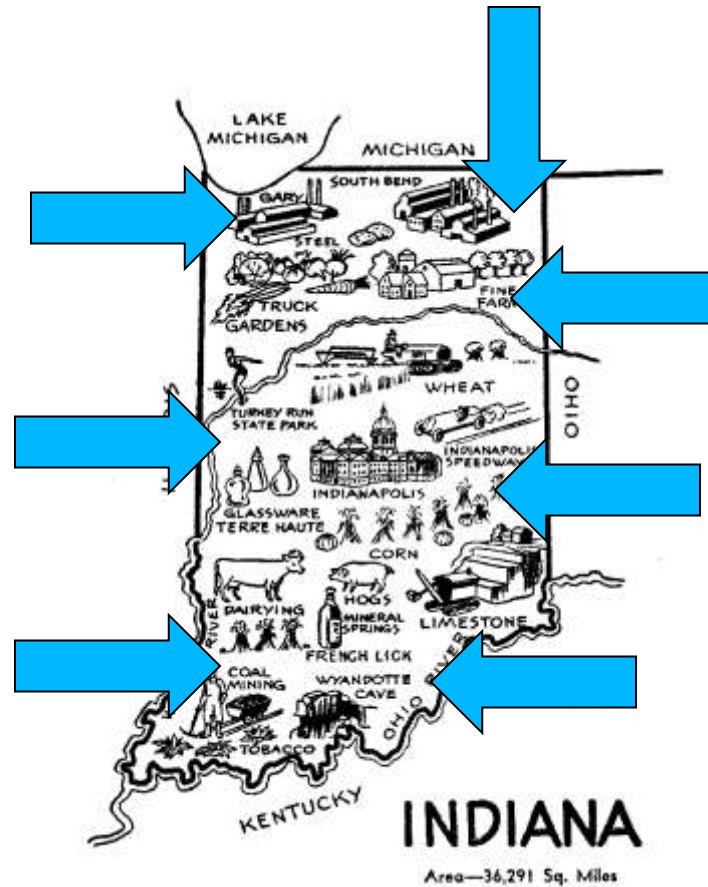
110 mg/kg

6.71%

340,000 cfu/g dry wt

3.78 mg/kg dry wt

Reporting Data to IDEM



Tips on Reporting Data to IDEM

Dry Wt vs %?
Dry Wt vs %?

PCBs?
PCBs?

Do I send the lab report as well?

Do I send the lab report as well?

Wet Wt vs Dry Wt?
Wet Wt vs Dry Wt?

Geometric Mean?
Geometric Mean?

Evaluating Your Test Results

Recommendation #1 - Verify all required analytes are included in your report.

- Nutrients
 - Ammonia-N, Nitrate-N, TKN , T. Nitrogen, T. Phosphorus, P_2O_5 , K, K_2O
- Metals
 - As, Cd, Cu, Hg, Pb, Mo, Ni, Se, Zn
- PCBs
- Fecal Coliform Bacteria (Class A or Class B Biosolids)
- % Solids
- Misc. analytes

Evaluating Your Test Results

Recommendation #2 – Review your report for any hold time flags.

- SOUR Test HT is 2 hours
- Fecal Coliform Bacteria HT is 24 hours
- HT exceedances on either will result in resampling
- Nitrate-N HT is 48 hours
- % Solids HT is 7 days
- PCBs HT is ONE YEAR

Evaluating Your Test Results

Recommendation #3 – Compare results to historical values.

- Compare on a dry wt basis or %

Possible Causes for Differences:

- Non-representative sample
- Dilution factors incorrectly applied
- Matrix interferences present



Does lab report contain a MS/MSD
narrative?

Was the prep method adequate for the
sample matrix?

Sample Date	TKN	NO3	K	T.P.	As	Cd
Mar-10	44,300	7.98	1200	22,000	3.42	1.17
Apr-10	39,100	10.1	977	23,500	2.79	2.01
May-10	42,800	0.60	1100	19,800	4.50	1.89
June-10	37,000	11.3	1300	23,100	2.79	1.57
July-10	21,600	8.94	1240	20,700	3.81	2.10
Aug-10	41,500	10.8	1080	19,400	4.10	16.6
Sept-10	38,400	8.74	990	22,800	3.36	0.99

Evaluating Your Test Results

% Solids Analysis, Method 2540G

Factors which affect result



Evaluating Your Test Results

Recommendation #4 – Compare related results.

- TKN = Organically bound N + Ammonia-N
- Total Nitrogen = TKN + Nitrate-N
- K₂O is calculated from the Potassium result
- P₂O₅ is calculated from the T.Phosphorus result

Units	TKN	NH ₃ -N	NO ₃ -N	T.N.	K	K ₂ O	T.Phos	P ₂ O ₅
Mg/Kg Dry Wt	44,300	8050	1.31	44301	2220	2670	28,500	65,300
%	4.43	0.80	0.0020	4.43	0.22	0.27	2.85	6.53

Evaluating Your Test Results

Recommendation #5 – Verify that the reporting limits are below required limits for any < or ND results.

Labs must determine limits of detection annually

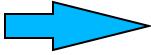
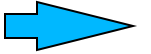
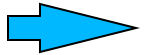
- 40 CFR Part 136, Appendix B

Labs should verify the reporting limit annually

Common Errors in Reporting Results to IDEM

- Lab report is not included
- Numbers are transposed when entered into the EZ land application spreadsheet report
- Most common “omitted” parameters are Molybdenum and PCBs
- Wet weights reported instead of dry weights
- Nutrients not reported as a %
- Results that are not detected should be reported at the reporting limit (<10 should be reported as “10”)

Tips on Reporting Data to IDEM

- Refer to Land Application Permit or NPDES permit for test parameters.
- Check for transposition errors
- Report results in proper units
 - Metals  mg/kg dry weight
 - PCBs  mg/kg dry weight
 - Nutrients  % dry weight
- Fecal Coliform Bacteria
 - Report the Geometric Mean of 7 Samples
 - Softens the effect of very high or very low values which would bias a straight average value
- Include the laboratory report in it's entirety

Questions?

