



Inside the wretched
scribblings from the lab:

A beginner's guide to interpreting
trade waste results

Contents of a foul grimoire

- ▶ Beginning the investigation
- ▶ Sample type
- ▶ Complications
- ▶ Common components
- ▶ Uncertainty of measurement
- ▶ Component relationships
- ▶ Context and industry, understanding operations
- ▶ Inside the Matrix
- ▶ Datasets
- ▶ Where to look next?

Beginning the intrepid investigation

What, where, who, when, why and how?

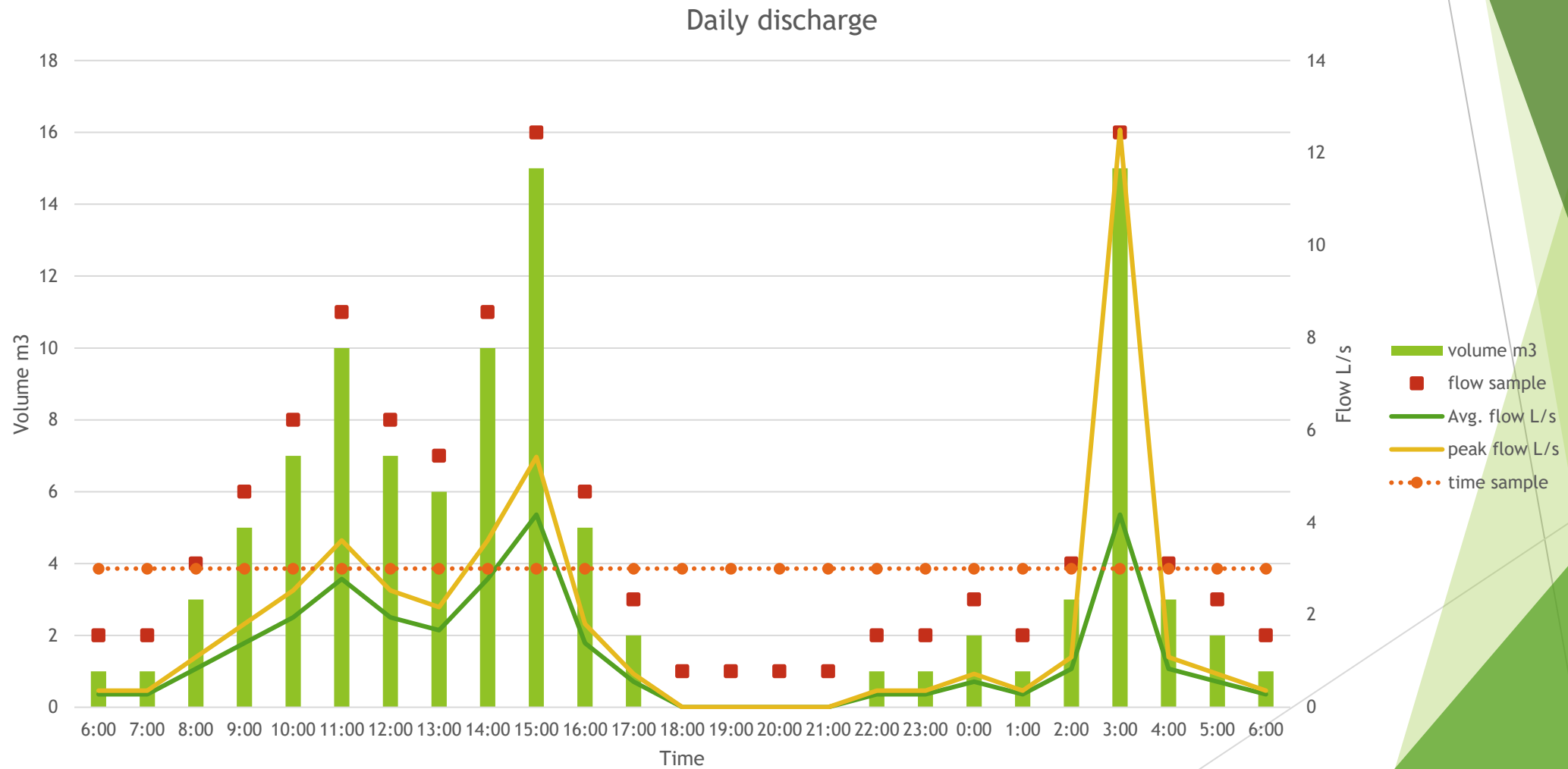


Sample type

(when, why and how)

- ▶ Grab – snatch and go
- ▶ Time based composite – ingredients of pi
- ▶ Flow proportional – a recipe for pi
- ▶ Discrete sampler – a tale of 3am

Flow, volume, and sample type



Complications

- Sample point
- Floating fats and bottom solids
- Sampler type
 - Peristaltic
 - Pneumatic
 - Vacuum
 - Solenoid



Common Components

pH

How compliant is non-compliant? Poorly buffered or just not chilled?

TSS (Total Suspended Solids)

Caught on filter paper. But is it gross enough?

cBOD5 (Carbonaceous Oxygen Demand)

A standard for bioavailability and partners well with COD

COD (Chemical Oxygen Demand)

Fully oxidise the sample to reveal its nature

TKN (Total Kjeldahl Nitrogen)

Organic nitrogen plus inorganic ammonia compounds

TP (Total Phosphorus)

PHOSPHORUS

OAG (Oil and Grease)

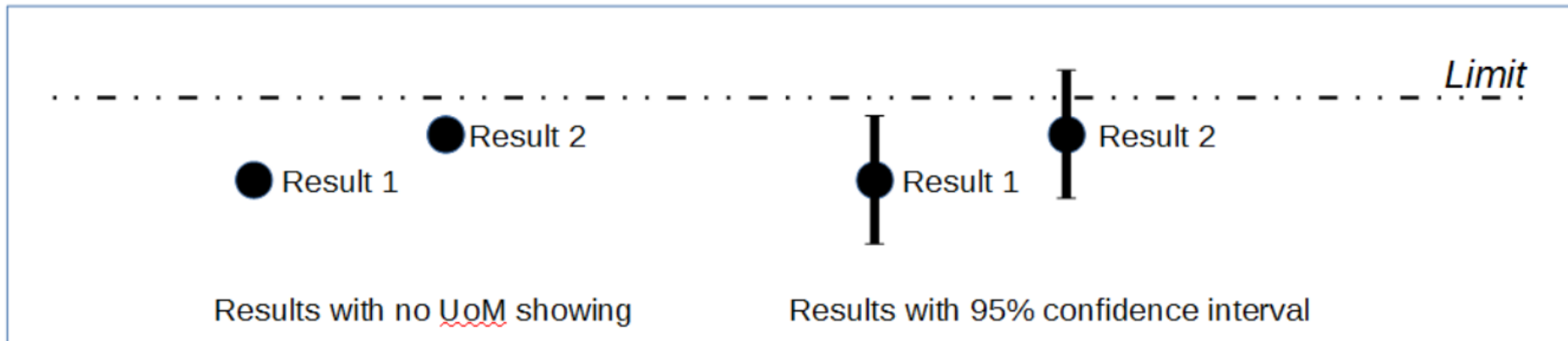
Clogged arteries and sewer fatbergs

TPH (Total Petroleum Hydrocarbons)

Know more with the C7 to C36 breakdown

Uncertainty of measurement

The spoon is 15cm $\pm$ 1cm, at a 95% confidence level, any bigger and it's a ladle over the limit.



Component relationships



Context and industry: Understanding operations

- ▶ What, where and who?
- ▶ When was that grease trap cleaned out?
- ▶ Domestic wastewater inclusion



Context and industry: Understanding operations

- ▶ What, where and who?
- ▶ When was that grease trap cleaned out?
- ▶ Domestic wastewater inclusion



Inside the Matrix

With Agent Smith

► Matrix effects

“Manifestations of non-target analytes or physical/chemical characteristics of a sample that prevents the quantification of the target analyte (the compound or element of interest) adversely impacting the reliability of the determination.”

► Inhibitory effects

“They killed our bugs folks”



BEST PRACTICAL OPTION FOR ENVIRONMENTAL SUCCESS

Data sets

How much information do you have?

Seasonality?

Outliers?

Date	Days covered	Lab. No.	Volume	pH	Total Suspended Solids		Carbonaceous Biological Oxygen Demand (5 day)		Oil & Grease		Total Phosphorus		Total Kjeldahl Nitrogen		MBAS - methylene blue active substances		COD	
			m ³	pH units	g/m ³	kg/d	g.O ₂ /m ³	kg.O ₂ /d	(g/m ³	kg/d	g/m ³	kg/d	g/m ³	kg/d	g/m ³	kg/d	g/m ³	kg/d
30-Jul-20	Wed/Thu		18.90	6.1	159	3.0	598	11	97	1.8	5.69	0.11	35	0.66	0.4	0.008	1047	20
21-Aug-20	Thu/Fri		11.51	6.2	188	2.2	801	9.2	140	1.6	9.36	0.11	32	0.36	0.4	0.005	1133	13
17-Sep-20	Wed/Thu		53.32	5.0	1025	54.7	2280	121.6	660	35.2	14.4	0.77	74	3.95	0.6	0.032	4086	218
16-Oct-20	Thu/Fri		43.17	5.9	640	27.6	1930	83.3	440	19.0	12.6	0.54	57	2.48	< 0.1	< 0.004	2749	119
18-Nov-20	Tues/Weds		43.03	5.1	523	22.5	961	41.4	370	15.9	10.1	0.43	51	2.19	0.2	0.009	2030	87
3-Dec-20	Wed/Thu		45.86	5.3	532	24.4	1630	74.8	410	18.8	11	0.50	54	2.46	< 0.1	< 0.005	2783	128
20-Jan-21	Tues/Weds		30.55	5.7	416	12.7	1250	38.2	350	10.7	9.6	0.29	42	1.29	0.3	0.009	2064	63
12-Feb-21	Thu/Fri		43.36	5.4	728	31.6	1990	86.3	560	24.3	12	0.52	56	2.43	0.2	0.009	3706	161
18-Mar-21	Wed/Thu		52.82	6.4	417	22.0	1190	62.9	360	19.0	8.8	0.46	40	2.12	0.2	0.011	1707	90
23-Apr-21	Thu/Fri		45.11	6.6	464	20.9	1110	50.1	430	19.4	9.51	0.43	42	1.90	0.8	0.036	1673	75
13-May-21	Wed/Thu		36.89	6.1	297	11.0	841	31.0	260	9.6	4.26	0.16	35	1.29	0.5	0.018	1371	51
4-Jun-21	Thu/Fri		25.51	6.2	249	6.4	656	16.7	150	3.8	4.44	0.11	18	0.46	0.9	0.023	1302	33
15-Jul-21	Wed/Thu		7.68	6.6	68	0.5	296	2.3	18	0.1	1.6	0.01	22	0.17	0.7	0.005	459	4
3-Sep-21	Thu/Fri		42.53	6.7	315	13.4	680	28.9	220	9.4	5.61	0.24	26	1.10	0.3	0.013	991	42
13-Oct-21	Tues/Weds		57.32	6.5	204	11.7	439	25.2	110	6.3	5.5	0.32	25	1.42	0.6	0.034	987	57
4-Nov-21	Wed/Thu		39.14	6.4	233	9.1	706	27.6	190	7.4	5.46	0.21	23	0.89	1.0	0.039	1040	41
3-Dec-21	Thu/Fri		42.10	6.2	342	14.4	868	36.5	240	10.1	6.83	0.29	29	1.21	0.3	0.013	1326	56
20-Jan-22	Wed/Thu		37.37	6.0	419	15.7	1150	43.0	300	11.2	8.83	0.33	41	1.52	0.2	0.007	1745	65
17-Feb-22	Wed/Thu		67.70	6.8	117	7.9	227	15.4	72	4.9	1.87	0.13	7	0.49	0.4	0.027	350	24
11-Mar-22	Thu/Fri		33.13	6.5	271	9.0	704	23.3	200	6.6	6.8	0.23	32	1.05	1.4	0.046	1425	47
7-Apr-22	Wed/Thu		54.26	6.6	380	20.6	839	45.5	250	13.6	8.04	0.44	33	1.80	0.7	0.038	1620	88
26-May-22	Wed/Thu		26.65	10.1	149	4.0	631	16.8	75	2.0	4.32	0.12	58	1.54	1.7	0.045	1205	32
10-Jun-22	Thu/Fri		28.48	6.4	275	7.8	731	20.8	190	5.4	5.44	0.15	10	0.29	1.1	0.031	1330	38
7-Jul-22	Wed/Thu		19.39	7.1	132	2.6	438	8.5	71	1.4	3.1	0.06	31	0.61	5.8	0.112	812	16
Minimum			7.68	5.00	68	0.5	227	2.3	18	0.1	1.6	0.01	7	0.17	0.2	0.00	350	4
Maximum			67.70	10.10	1025	55	2280	122	660	35.2	14.4	0.77	74	3.95	5.8	0.11	4086	218
Avg./Median since Jul-20			37.74	6.3	356	14.8	956	38	257	10.7	7.3	0.29	36	1.40	0.9	0.03	1623	65
Consent limit 2021			65	6 to 10	2000	-	-	60	500	-	150	-	250	-	300	-	-	180



Where to look for more information?

BPO Key Services

- ▶ Trade Waste Management
- ▶ Environmental Compliance Monitoring
- ▶ Consulting
 - Cleaner Production
 - Wastewater Process & Design & Engineering
 - Remediation
 - Bio-energy and Resource Recovery
- ▶ After Care Services
- ▶ Independent Piloting and testing



BEST PRACTICAL OPTION FOR ENVIRONMENTAL SUCCESS

Who we are...

- ▶ BPO is a New Zealand privately owned Company and specialists in environmental and waste management consulting and engineering.
- ▶ BPO's Head office is based in Hamilton, with offices in Palmerston North
- ▶ The BPO team has over 20 years of experience, knowledge and practical understanding within the food industry and dairy processing.
- ▶ BPO currently operates in New Zealand, Australia, Indonesia and Thailand.
- ▶ BPO is the trading as entity of GP2020 Holdings Ltd.



BEST PRACTICAL OPTION FOR ENVIRONMENTAL SUCCESS

