
QUALITY
Environmental Data & Environmental Information

2015 QA Conference

New QA Staff – Surviving the First 3 Months

We each have our own learning style, in this session I'll describe what worked for me when confronted with:

The Curse of No Succession Planning (and no file retention)

The Essential Benefit of a Mentor

I will discuss examples of tools I developed for my use:

- Open Items List (OIL) – Agenda for weekly mentoring sessions & Tracking
- Lists and Notebooks of Training & QA Materials (NTM) read – like a library
- Hard copy, electronic directory and emails
- Alphabetical List of the "Good Stuff" (ALGS) [aka Best Practices] – where did I read about that?
- Cumulative Numbered Listing of Materials Read (CNLMR)
- Compendium of Glossaries and Acronyms (CGA)
- Practical Examples

The Essential Benefit of a Mentor

bold is why open
Prior text
Notes from last call
New text
Items to discuss this time

OPEN as of 12/11 [Should we meet on 12/30 and continue weekly into 2015?]

1. Other training, or reading I should schedule?

2. Tracking spreadsheet

3. Project files [consider replacing with separate QAARWP list – see attached file]
   a. 3-11 HW Nutrient Tech: have annotated SOW QARF –smk- 6/10. Copied me with QAPP, (ck w contractor for, QASP) **add to tracker**? 9/2 discussed my comments and MK with BL for discussing with contractor. Provided BL clean comments, call w HW 9/5. 9/9 sent rev Appx F to BL; got 10/6 QAPP, rev checklist 10/13. -sbk- 10/16.

   [Evolved reference structure for tracker, email, and My Task To Do List subject lines]
   | QA | WA# | Contractor | Doc. Type | WAM | Key Words |

4. Upcoming Meetings/ Calls

5. Upcoming Actions

CLOSED ITEMS

Examples of Tools

- Taking notes while reading
- Identifying good references
- Creating keyword indexes

QA Index to "The Good Stuff" **◊ = attached** **August 10, 2015**

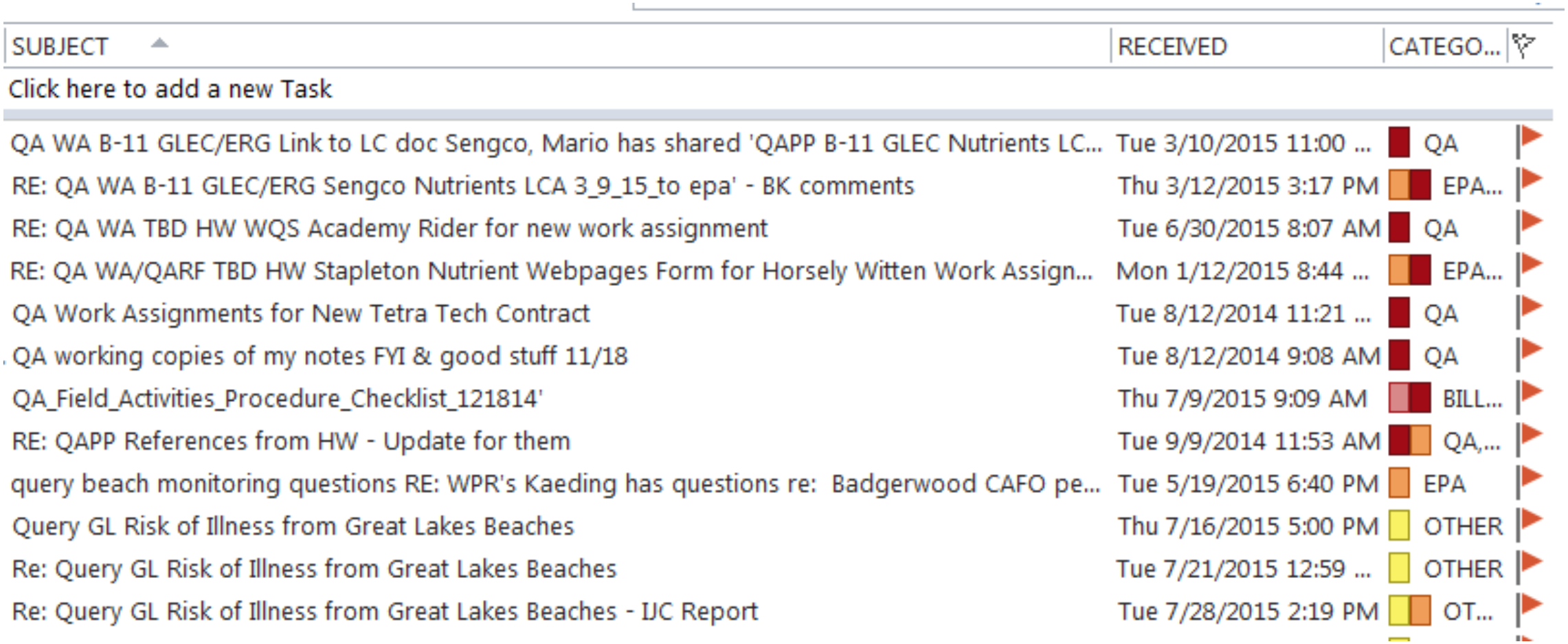
◊ Assessment Factors List #8 p. 4, #12 p. 5
Authority/roles diagram #3 p. 10-11, #7 p. 16, #18 p. 6
Confidence intervals #23c p. 23
Confidential Business Information (CBI) data #21 7-2 see also Proprietary
◊ Contracting process <-> QA #5 last page before green CMM X EPAAG, 25b re COR resp.
◊ Data definition and examples WA 3-001 CSC Kelly p. 7 / Data Decision Tree #8a StateoftheEstuary p. 13
◊ Data Life Cycle #23c, p. 3
◊ Data Quality Assessment (DQA) Process #12 p. 85; #28, p92
◊ Data Quality Assessment <-> Project Planning Life Cycle #23c p3
Data Quality Indicators (DQI) #12 p. 83-84; #13 p. 19-21 chart; #21 Appx A, #28, p. 105;
http://water.epa.gov/scitech/swguidance/standards/criteria/health/microbial/upload/coliphages-literature-review-report-2015.pdf
Data sufficiency #23c, p. 26
◊ QA IQG-DQO-DQI comparison chart
◊ Data Quality Objectives Process (DQO) #11 A-3, #12 p 8
◊ DQO <-> QAPP #11 A-3; #12 p. 11; e.g., NCCR QAPP ref WA 0-01 TT Stahl

Lists of Reference Materials

August 10, 2015

1. OW Reviewing QAPPs Training Package	9/16/2014 ~~7/9/14~~
a. Mod for Existing Data (see 17c Red, green, blue CHECKLIST)	
b. Relating FOG to QAPPs (Field Operation Guidelines) see also #29	
c. Reviewing QAPPs, e.g., active voice	
d. Checklist – Primary Data	
e. Additional Slides	
f. Grants	10/22/14 & 3/31/2015
g. Method Development	10/22/14
2. a. Information Quality Guidelines (IQG) Checklist documentation	FY 2013
b. and OW instruction materials; ver. 2.3	September 23, 2010
c. and OCFO IQ Guidelines (Oct 2002, EPA/260 R-02-002)	2 July 2003
d. and OW training materials ver. 2.2	February 2003
eBeaches information for QAARWP (in file)	FY 2013
SHPD QAARWP (in file)	09/23/04
Beaches QAPP (in file)	September 12, 2008
3. OW QMP Rev. 3	February 2009
a. References CFR (see 2.c)	9/16/2014

Use of Outlook To-Do List to Track Open & Reference Emails



SUBJECT	RECEIVED	CATEGO...
Click here to add a new Task		
QA WA B-11 GLEC/ERG Link to LC doc Sengco, Mario has shared 'QAPP B-11 GLEC Nutrients LC...	Tue 3/10/2015 11:00 ...	QA
RE: QA WA B-11 GLEC/ERG Sengco Nutrients LCA 3_9_15_to epa' - BK comments	Thu 3/12/2015 3:17 PM	EPA...
RE: QA WA TBD HW WQS Academy Rider for new work assignment	Tue 6/30/2015 8:07 AM	QA
RE: QA WA/QARF TBD HW Stapleton Nutrient Webpages Form for Horsely Witten Work Assign...	Mon 1/12/2015 8:44 ...	EPA...
QA Work Assignments for New Tetra Tech Contract	Tue 8/12/2014 11:21 ...	QA
QA working copies of my notes FYI & good stuff 11/18	Tue 8/12/2014 9:08 AM	QA
QA_Field_Activities_Procedure_Checklist_121814'	Thu 7/9/2015 9:09 AM	BILL...
RE: QAPP References from HW - Update for them	Tue 9/9/2014 11:53 AM	QA,...
query beach monitoring questions RE: WPR's Kaeding has questions re: Badgerwood CAFO pe...	Tue 5/19/2015 6:40 PM	EPA
Query GL Risk of Illness from Great Lakes Beaches	Thu 7/16/2015 5:00 PM	OTHER
Re: Query GL Risk of Illness from Great Lakes Beaches	Tue 7/21/2015 12:59 ...	OTHER
Re: Query GL Risk of Illness from Great Lakes Beaches - IJC Report	Tue 7/28/2015 2:19 PM	OT...

E.G., Title Template: | QA | WA# | Contract | Document Type - Status | EPA WAM | Key Words |

ANSI/ASQ	
CFO	chief financial officer
CIO	chief information officer
CO	contracting officer
COC	chain of custody
DQA	data quality assessment
DQI	data quality indicator
DQO	data quality objectives
ELG	Effluent Limitation Guideline
EPAAG	EPA Acquisition Guidelines
FITARA	Federal IT Acquisition Reform Act
GC	gas chromatography
IA	interagency agreement
IASSC	interagency agreement shared service center
IDQTF	integrated data quality task force (G5, D-1)
IFMS	integrated financial management system
IGMS	integrated grant management system
IQG	information quality guidelines
ISO	[illegible]

Example of Applying New Knowledge

Practical Exercise – Document Review

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BEFORE QUALITY ASSURANCE REVIEW

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AFTER QUALITY ASSURANCE REVIEW

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And the header

And any footer which may subsequently be added
after review and approval by
the authorized QA Official

Explaining to a Project Manager how a QAPP Benefits a Project's Products

A QAPP explains not only what work is planned to be done, but how the work will be performed. The QAPP's purpose is not to be the sole documentation of the work to be performed (although it can be), but rather to be a complete set of the documentation against which ongoing work will be monitored to assure the products are produced as expected. This oversight also provides the opportunity for early detection and correction of errors, and opportunities to improve the work processes. The final documentation is then used at the end of the project by QA staff external to the project but in the producing organization and by QA staff external to the producing organization as appropriate for quality assessments on the projects products prior to delivery to the Agency, to their use by the Agency.

Email Template Q&A for links to Existing Data Guidance and Examples

Q: Do you have a link or other reference that contractors would use for developing an EPA QAPP?

A: Yes because your project is using secondary (existing) data rather than primary (new field collection), I've pointed out a few particular documents:

General website:
http://www.epa.gov/quality/

Sub-page for QAPPs
http://www.epa.gov/quality/qapps.html
http://www.epa.gov/quality/qs-docs/r5-final.pdf

See particularly for existing data projects (in first link, see Chapter 3):
http://www.epa.gov/quality/qs-docs/g5-final.pdf
http://www2.epa.gov/sites/production/files/2015-01/documents/assess2.pdf [Science Policy Council]
http://www2.epa.gov/osa/guidance-evaluating-and-documenting-quality-existing-scientific-and-technical-information [Addendum]

Examples of Collecting and Integrating Terminology and Concepts

Chart to Collect and Organize Terminology: e.g., IQG, DQO, DQI

QA Information Quality Guidelines (IQG) – Data Quality Objectives (DQO) – Data Quality Indicators (DQI) [Existing (Secondary)] October 6, 2014

8/2/11 OW DQA/IQG Module #2, 4 ("Quality" O, U, I)	SPC Assessment Factors #8	Addendum to SPC - #8a assess links: 4-8, coastal	DQO #12, DQI #13 (p. 20-21), #19	DQA #23c
Objectivity				
- Proper context	**Applicability and ***	**Focus, (Applicability 5)** **Relevance/context (7)** - mechanistic - weight-of-evidence - trials, studies (8)		
-	- Theory	-	-	-
-	- purpose	-	-	-
-	- Design	-	-	-
-	- outcome measures and results	-	-	-
-	-	**Key Studies (assess4)** *- new* *- confirms* *- replaces prior* *- best or only* *- 9 weighting factors*		
- Accurate - reliable	-		**Accuracy = precise and ***	
- clear	**Clarity and ****	**Focus, Clarity (&5)** - writing style ok for audience	-	-
- complete	****Completeness (of documentation)+**	**Rigor** – important, meaningful, depth of intellect (&5)	**Completeness** data set (robust)	Data Sufficiency, Power, p. 24 - 26
-	- Design	-	-	-
-	- data (results, limitations)	Data Decision Tree (coastal)	-	-
-	- Assumptions	-	-	-
-	- quality assurance	-	-	-
-	- Sponsors	-	-	-
-	- Analyses	-	-	-
-	- theory (if novel v/v accepted)	- new science, documented	-	-

Hypothesis Test Results [After EPA QA/G-4, February 2006, p. 49, Table 7, and p. 49]

"... a null hypothesis [(H_0)], which is a "baseline condition" that is presumed to be true in the absence of strong evidence to the contrary, as well as an *alternative hypothesis* [(H_a)], which bears the burden of proof. In other words, the baseline condition will be retained unless the alternative condition (the alternative hypothesis) is thought to be true due to the preponderance of evidence …" (EPA QA/G-9R, pp. 8-9)

Statistical Hypothesis Tests Lead to Four Possible Outcomes		
Decision You Make by Applying the Statistical Hypothesis Test to the Collected Data	**True Condition (Reality)**	
	Baseline Condition (H_0) is True	**Alternative Condition (H_a) is True**
Decide that the Baseline Condition (H_0) is True	**Correct Decision**	Decision Error (False Acceptance) (False Negative) Type II Error (β)
Decide that the Alternative (H_a) to the Baseline Condition is True	Decision Error (False Rejection) (False Positive) Type I Error (α)	**Correct Decision (Statistical Power 1-β)**

"The primary aim of Step 6A of the DQO Process is to arrive at upper limits on the probabilities of each of these two types of decision errors that you and the planning team find acceptable." (p. 49)

"An alternative way of reporting the result of a statistical test is to report its *p*-value, which is defined as the probability, assuming the null hypothesis to be true, of observing a test result at least as extreme as that found in the data. … Thus the relationship between *p*-values and the classical hypothesis testing approach is that one rejects the null hypothesis [significant result] if the *p*-value associated with the test result is less than the agreed upon false rejection rate [α]. If an analyst had chosen the false rejection error rate as 0.05 before the data were collected and reported a *p*-value of 0.12, then the conclusion would be "do not reject the null hypothesis" [nonsignificant result]; if the *p*-value had been reported as 0.03, then the conclusion would be "reject the null hypothesis." An advantage of reporting *p*-values is that they provide a measure of the strength of evidence for or against the null hypothesis, which allows reviewers to establish their own false rejection error rates." (EPA QA/G-9R, pp. 25-26)

Plain English Restatement

The baseline condition will be retained unless the alternative condition is thought to be true due to the preponderance of evidence. Where "predominance" means, the alternative has a smaller probability of being false (greater probability of being true) than we said we would be comfortable with, i.e., less than 5% chance of the alternative condition not being true (>95% chance of being true) (i.e. the data has a p-value of less

Opportunities for Future Tools

- Sharepoint with:
  - Training Curriculum structured by QA Role
  - Repository of Documents – searchable by:
  - Keyword index – identifying:
  - Good Practice examples – shareable outside EPA (and not)
  - Acronyms / Glossary
  - Contact information to Subject Matter Experts

- Tracking System with Reports

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QCIX Notes (9/10/15):

- Communication Team - Sharepoint
- Training Team (OW QMP)
- QMS (Phase III)

ide EPA (and not)

perts

- QATS Phase II

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Practical Examples

Opportunities for Future Tools

In QA, the only “Gotcha” is I’ve Got Your Back©