



# Priority Action Report

## Geological Materials

Chemistry/Instrumental Analysis

Andrew M. Bowen

February 14, 2017





# Subcommittee Leadership

<b>Position</b>	<b>Name</b>	<b>Organization</b>	<b>Term</b>	<b>Email</b>
Chair	<b>Andrew Bowen</b>	<b>U.S. Postal Inspection Service</b>	<b>3 years</b>	<b>ambowen@uspis.gov</b>
Vice Chair	<b>Brad Lee</b>	<b>University of Kentucky</b>	<b>4 years</b>	<b>brad.lee@uky.edu</b>
Executive Secretary	<b>Kim Mooney</b>	<b>US Army Criminal Investigation Lab</b>	<b>3 years</b>	<b>kim.e.mooney.civ@mail. mil</b>



# Subcommittee Members



#	Name	Organization	Term	Email
1	Bill Schneck	Washington State Patrol Crime Lab	4	bill.schneck@wsp.wa.gov
2	Andrew Bowen	U.S. Postal Inspection Service	3	ambowen@uspis.gov
3	Kim Mooney	US Army Criminal Investigation Lab	3	kim.e.mooney.civ@mail.mil
4	Maureen Bottrell	Department of Justice, Federal Bureau of Investigation	3	maureen.bottrell@ic.fbi.gov
5	Jack Hietpas	Penn State University	4	jzh333@psu.edu
6	Brad Lee	University of Kentucky	4	brad.lee@uky.edu
7	Skip Palenik	Microtrace LLC	3	spalenik@microtracellc.com
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9	David Szymanski	Bentley University	4	dszymanski@bentley.edu
10	Cynthia Zeissler	NIST/Dept. of Commerce	3	cynthia.zeissler@nist.gov
11	Martin T. Wells	Cornell University	3	martin.t.wells@gmail.com
12	Libby Stern	Department of Justice, Federal Bureau of Investigation	3	libby.stern@ic.fbi.gov
13	Wayne Isphording	Self Employed	3	isphordingw@bellsouth.net
14	Christopher Bernhardt	US Geological Survey	3	cbernhardt@usgs.gov



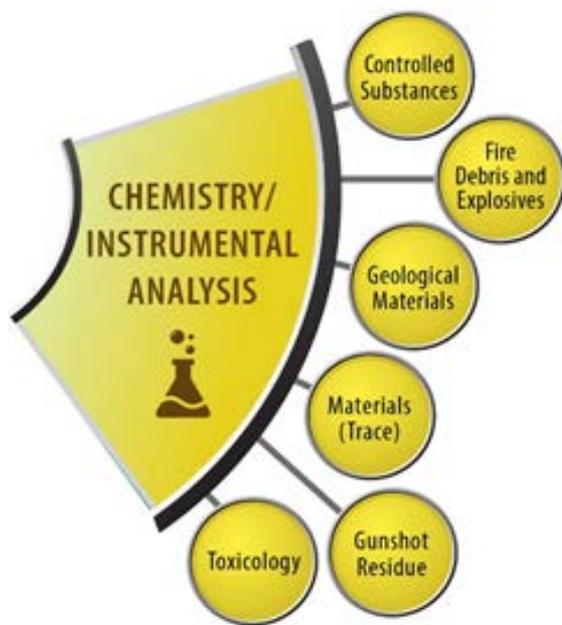
# Subcommittee Affiliates



#	Name	Organization	Term	Email
1	Robert Fitzpatrick	Centre for Australian Forensic Soil Science CAFSS	N/A	rob.fitzpatrick@csiro.au
2	Alastair Ruffell	Queen's University, Belfast	N/A	alastairruffell@me.com
3	Duncan Pirrie	Helford Geoscience LLP	N/A	dpirrie@helfordgeoscience.co.uk



# Geological Materials



**Develop consensus standards and guidelines for the collection and analysis of soils and other geological materials; create a framework for the interpretation and reporting of analytical results; establish educational and training requirements for forensic practitioners; and foster the publication and presentation of research within the forensic geosciences community.**

# Summary of Standards/Guidelines Priority Actions



Priority	OSAC Process	Working Title of Document
High	SDO-200	Standard Guide for the Collection of Soils and Other Geological Evidence for Forensic Applications
High	SDO-200	Standard Guide for the Forensic Analysis of Soil
Medium	SDO-200	Standard Guide for Microscopy of Soil Evidence
Medium	SDO-200	Standard Guide for Elemental Analysis of Soil Evidence
Medium	SDO-200	Standard Guide for X-Ray Diffraction Analysis of Soil Evidence





# Standards/Guidelines Development Priority 1 Document

**Document Title:** Standard Guide for the Collection of Soils and Other Geological Evidence for Forensic Applications

**Scope:** This guide is designed as a resource for forensic scientists, law enforcement personnel, and other professionals whose job responsibilities include the collection and preservation of soil evidence at crime scenes.

**Objective/rationale:** This guide is intended to serve as a resource for the development of individual agency procedures regarding the collection of soils and other geological evidence for forensic applications.

**Issues/Concerns:** No standard currently exists for this process.

**Task Group Name:** Geological Materials Field Testing

**Task Group Chair Name:** Kim Mooney

**Task Group Chair Contact Information:**

kim.e.mooney.civ@mail.mil

**Date of Last Task Group Meeting:** October 2016



# Standards/Guidelines Development Priority 1 Document

## Key Components of Standard:

- Collection strategies
- Collection tools
- Collection techniques
- Documentation, preservation, packaging, and transportation of samples

# Workshop Held in Fall 2016 at CAC/ASTEE Meeting to Evaluate Document



# Task Group/Subcommittee Action Plan

Planned Actions	OSAC Process Stage (e.g., SDO 100)	Assignee	Estimated Completion Date
Edit based on workshop feedback	SDO-200	Brad Lee Marianne Stam	April 2017
Evaluate technical merit	SDO-200	Marianne Stam Dave Szymanski	April 2017
Submit to SAC with SDO Process Submission Form	SDO-300	Andrew Bowen	April 2017
Submit to SDO	SDO-700	Andrew Bowen	2017

*Priority 1: Standard Guide for the Collection of Soils and Other Geological Evidence for Forensic Applications*



# Standards/Guidelines Development Priority 2 Document

**Document Title:** Standard Guide for the Forensic Analysis of Soil

**Scope:** This guide is designed as a resource for forensic scientists, researchers, and other professionals whose job responsibilities include the analysis of soil evidence in laboratories.

**Objective/rationale:** This guide is intended to serve as a resource for the development of technical procedures regarding the analysis of soils for forensic applications.

**Issues/Concerns:** No standard currently exists for this process.

**Task Group Name:** Soil Analysis Guideline Task Group

**Task Group Chair Name:** Andrew Bowen

**Task Group Chair Contact Information:**

AMBowen@uspis.gov

**Date of Last Task Group Meeting:** August 2016



# Standards/Guidelines Development Priority 2 Document

## Key Components of Standard:

- Sample description
- Alternative sample processing methods
- Alternative instrumental methods
- Minimum standards for analytical schemes, methods, and interpretation

# Task Group/Subcommittee Action Plan

Planned Actions	OSAC Process Stage (e.g., SDO 100)	Assignee	Estimated Completion Date
Draft document	SDO-200	Task Group	January 2018
Determine means to test whether fit-for-purpose	SDO-200	Task Group	TBD
Submit to SAC with SDO Process Submission Form	SDO-300	Task Group	TBD

*Priority 2: Standard Guide for the Forensic Analysis of Soil*



# Standards/Guidelines Development Priority 3 Document

**Document Title:** Standard Guide for Microscopy of Soil Evidence

**Scope:** This guide is designed as a resource for forensic scientists, researchers, and other professionals whose job responsibilities include the analysis of soil evidence in laboratories.

**Objective/rationale:** This guide is intended to serve as a resource for the development of technical procedures regarding the analysis of soils for forensic applications.

**Issues/Concerns:** No standard currently exists for this process.

**Task Group Name:** Geological Materials Microscopy

**Task Group Chair Name:** Bill Schneck

**Task Group Chair Contact Information:**

Bill.Schneck@wsp.wa.gov

**Date of Last Task Group Meeting:** August 2016



# Standards/Guidelines Development Priority 3 Document

## Key Components of Standard:

- **Sample preparation for microscopy of soil evidence**
- **Alternative microscopical analysis methods**
- **Minimum standards for microscopy analytical schemes, methods, and interpretation**

# Task Group/Subcommittee Action Plan

Planned Actions	OSAC Process Stage (e.g., SDO 100)	Assignee	Estimated Completion Date
Draft document	SDO-200	Task Group	January 2018
Determine means to test whether fit-for-purpose	SDO-200	Task Group	TBD
Submit to SAC with SDO Process Submission Form	SDO-300	Task Group	TBD

*Priority 3: Standard Guide for Microscopy of Soil Evidence*



# Standards/Guidelines Development Priority 4 Document

**Document Title:** Standard Guide for Elemental Analysis of Soil Evidence

**Scope:** This guide is designed as a resource for forensic scientists, researchers, and other professionals whose job responsibilities include the analysis of soil evidence in laboratories.

**Objective/rationale:** This guide is intended to serve as a resource for the development of technical procedures regarding the analysis of soils for forensic applications.

**Issues/Concerns:** No standard currently exists for this process.

**Task Group Name:** Geological Materials Elemental Analysis

**Task Group Chair Name:** Jack Hietpas

**Task Group Chair Contact Information:** jzh333@psu.edu

**Date of Last Task Group Meeting:** August 2016



# Standards/Guidelines Development Priority 4 Document

## Key Components of Standard:

- **Sample preparation for elemental analysis of soil evidence**
- **Alternative elemental analysis methods**
- **Minimum standards for elemental analysis schemes, methods, and interpretation**

# Task Group/Subcommittee Action Plan

Planned Actions	OSAC Process Stage (e.g., SDO 100)	Assignee	Estimated Completion Date
Draft document	SDO-200	Task Group	January 2018
Determine means to test whether fit-for-purpose	SDO-200	Task Group	TBD
Submit to SAC with SDO Process Submission Form	SDO-300	Task Group	TBD

*Priority 4: Standard Guide for Elemental Analysis of Soil Evidence*



# Standards/Guidelines Development Priority 5 Document

**Document Title:** Standard Guide for X-Ray Diffraction Analysis of Soil Evidence

**Scope:** This guide is designed as a resource for forensic scientists, researchers, and other professionals whose job responsibilities include the analysis of soil evidence in laboratories.

**Objective/rationale:** This guide is intended to serve as a resource for the development of technical procedures regarding the analysis of soils for forensic applications.

**Issues/Concerns:** No standard currently exists for this process.

**Task Group Name:** Geological Materials XRD

**Task Group Chair Name:** Robert Fitzpatrick

**Task Group Chair Contact Information:** rob.fitzpatrick@csiro.au

**Date of Last Task Group Meeting:** August 2016

# Standards/Guidelines Development Priority 5 Document

## Key Components of Standard:

- **Sample preparation for x-ray diffraction analysis of soil evidence**
- **Alternative x-ray diffraction analysis methods**
- **Minimum standards for x-ray diffraction analytical schemes, methods, and interpretation**

# Task Group/Subcommittee Action Plan

Planned Actions	OSAC Process Stage (e.g., SDO 100)	Assignee	Estimated Completion Date
Draft document	SDO-200	Task Group	January 2018
Determine means to test whether fit-for-purpose	SDO-200	Task Group	TBD
Submit to SAC with SDO Process Submission Form	SDO-300	Task Group	TBD

*Priority 5: Standard Guide for X-Ray Diffraction Analysis of Soil Evidence*



# Summary of Standards/Guidelines Priority Actions



Priority	OSAC Process	Working Title of Document
High	SDO-200	Standard Guide for the Collection of Soils and Other Geological Evidence for Forensic Applications
High	SDO-200	Standard Guide for the Forensic Analysis of Soil
Medium	SDO-200	Standard Guide for Microscopy of Soil Evidence
Medium	SDO-200	Standard Guide for Elemental Analysis of Soil Evidence
Medium	SDO-200	Standard Guide for X-Ray Diffraction Analysis of Soil Evidence



# Standards/Guidelines Reviewed For Technical Merit

Title	Developing Organization	Status*	OSAC Process Stage (e.g., RA 100)
Standard Guide for the Collection of Soils and Other Geological Evidence for Forensic Applications	Geological Materials Subcommittee	Still Evaluating	SDO-200



## Research & Development Needs Identified

- **Research is needed to determine whether it is possible to anticipate scales of compositional heterogeneity of surface soils across a particular region.**
- **Research is needed to investigate the effects of different variables on the relative abundance of soil components after transfer.**
- **Development and evaluation of quantitative methods of soil analysis for forensic comparisons.**



# Priority Action Report

## Geological Materials

Chemistry/Instrumental Analysis

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February 14, 2017



