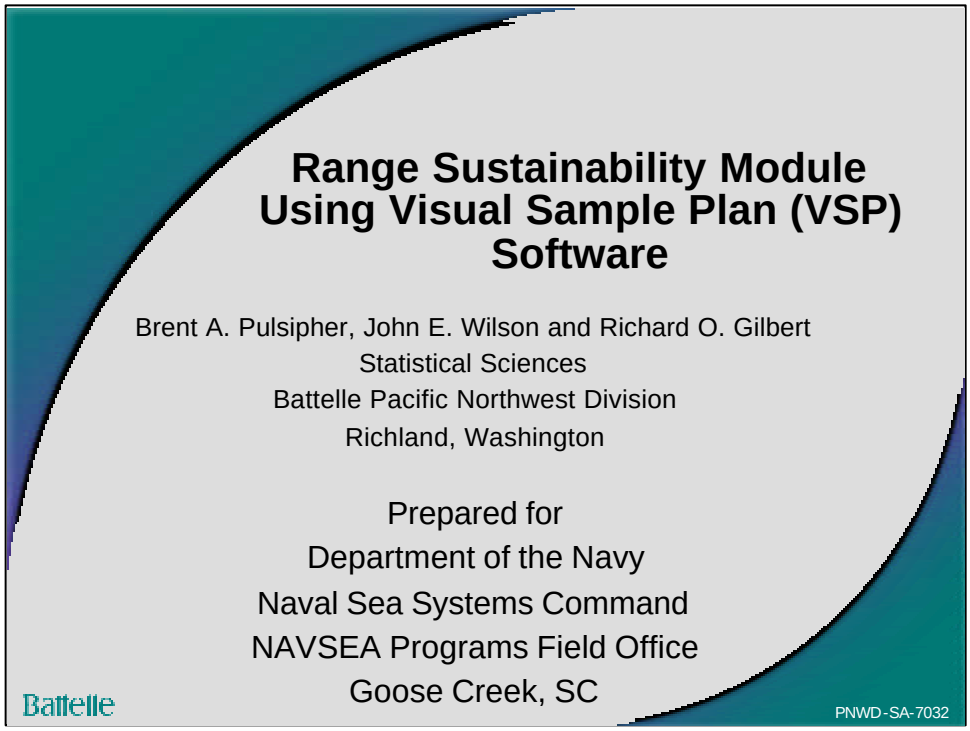
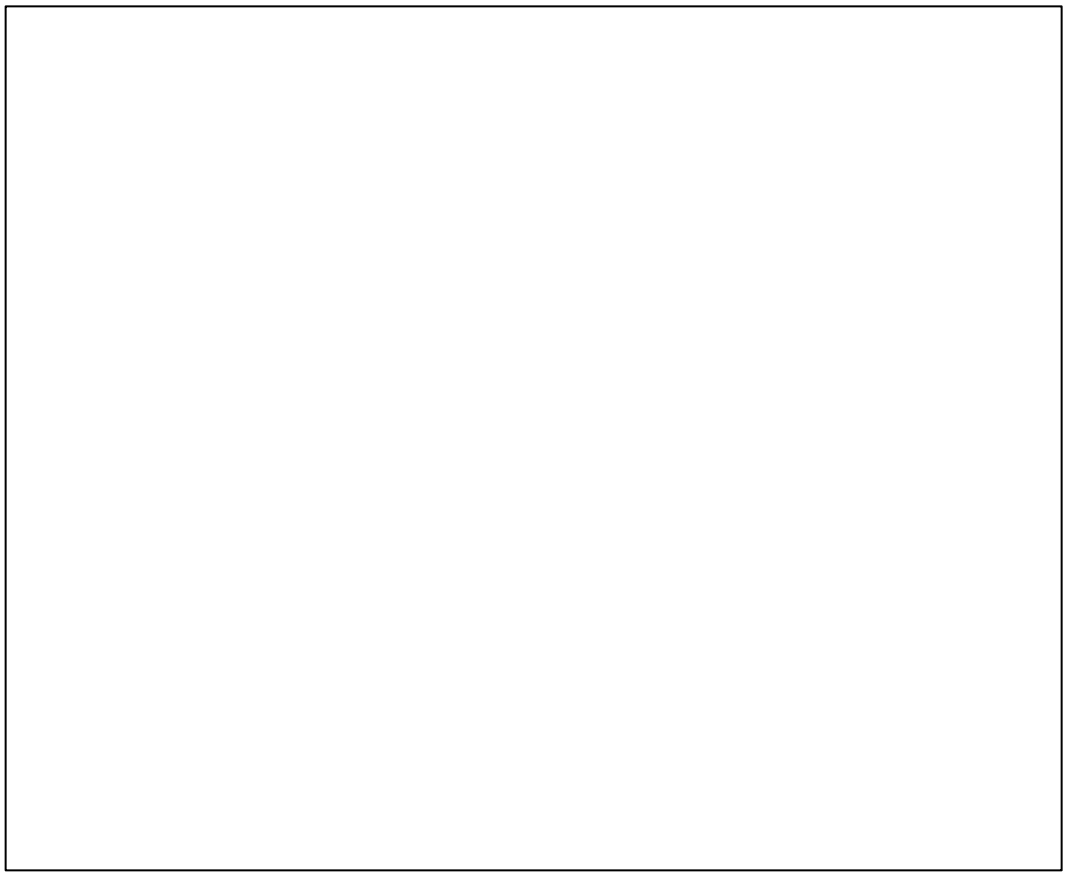

Range Sustainability Module
Using Visual Sample Plan (VSP)
Software
Brent A. Pulsipher, John E. Wilson and Richard O. Gilbert
Statistical Sciences
Battelle Pacific Northwest Division
Richland, Washington
Prepared for
Department of the Navy
Naval Sea Systems Command
NAVSEA Programs Field Office
Goose Creek, SC
Battelle
PNWD-SA-7032

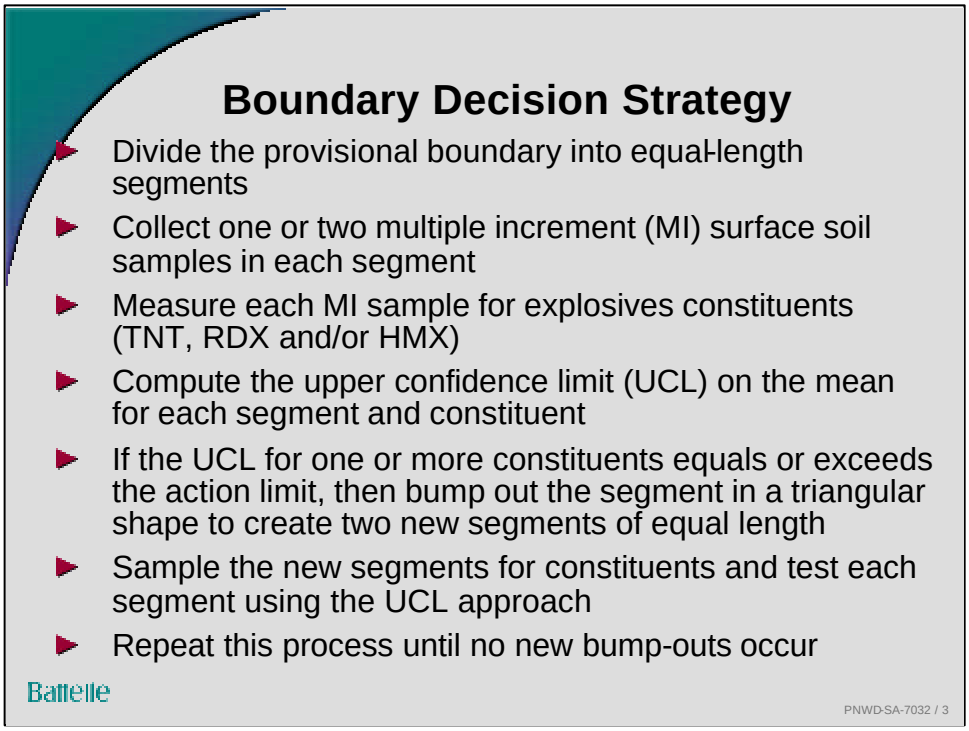
Objective

- Learn how to use the Range Sustainability (RS) Module in the Visual Sample Plan (VSP) software
  - to determine if explosives constituents in surface soil may have migrated beyond the provisional boundary of an active training range, and if so,
  - to estimate the location of a new provisional boundary that may enclose the area where mean concentrations exceed action limits.

Battelle

PNWD-SA-7032 / 2





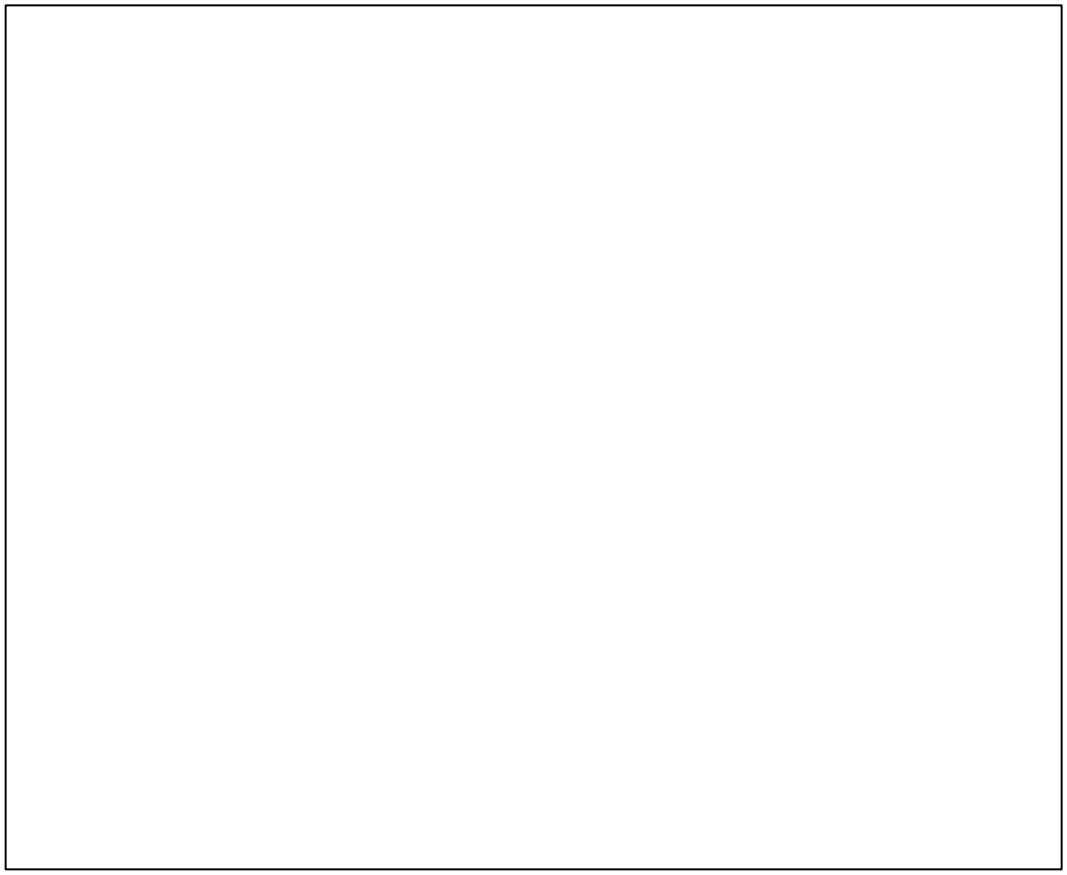
It is assumed that explosives constitutes in surface soil are not resuspended and transported through the air to distinct isolated hot spots outside the boundary. That is, it is assumed that explosives constituents in surface soil move as a plume across the boundary with no discontinuities over space.

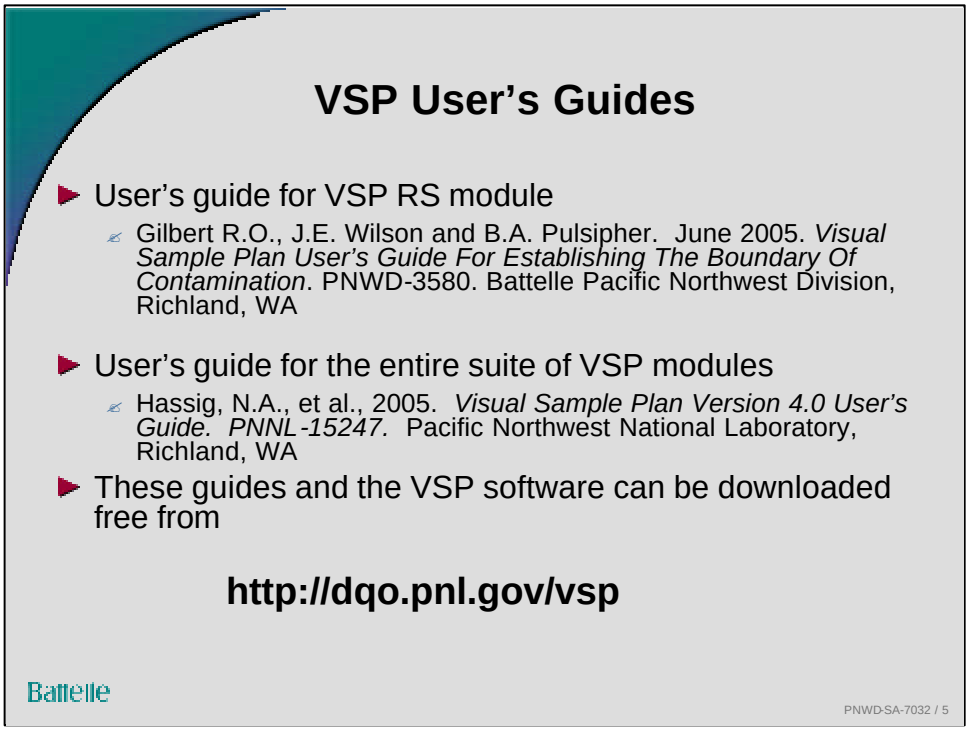
Outline of This Training

- Introduce Visual Sample Plan (VSP) software
- Outline the steps in using the VSP-RS module
- Describe each step
  - Provide illustrations, screen shots, and a case study

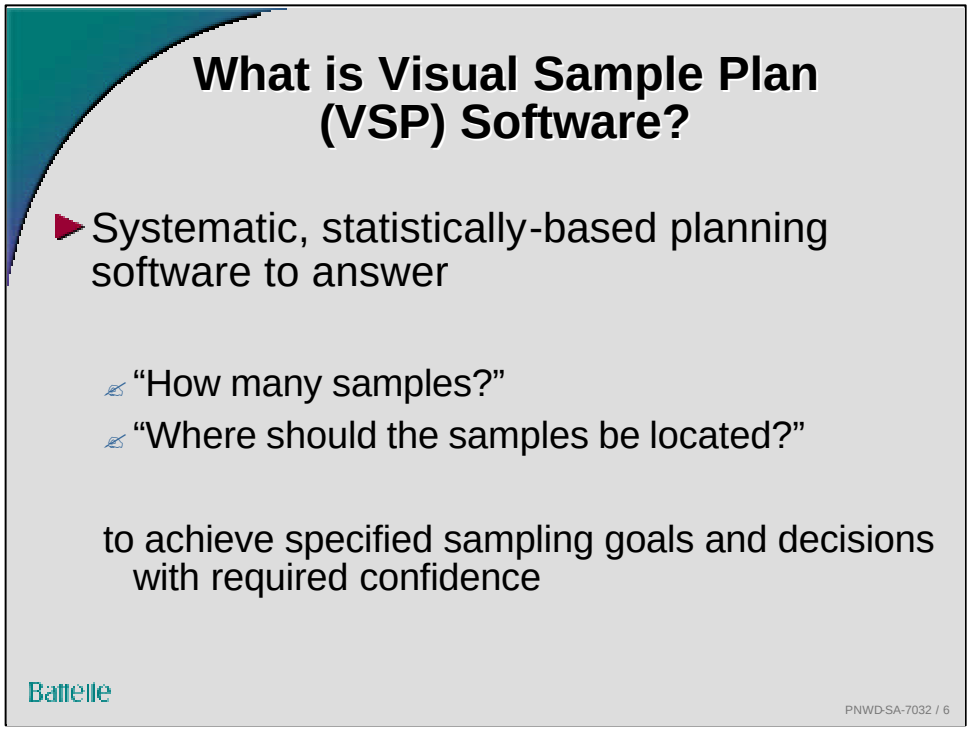
Battelle

PNWD-SA-7032 / 4

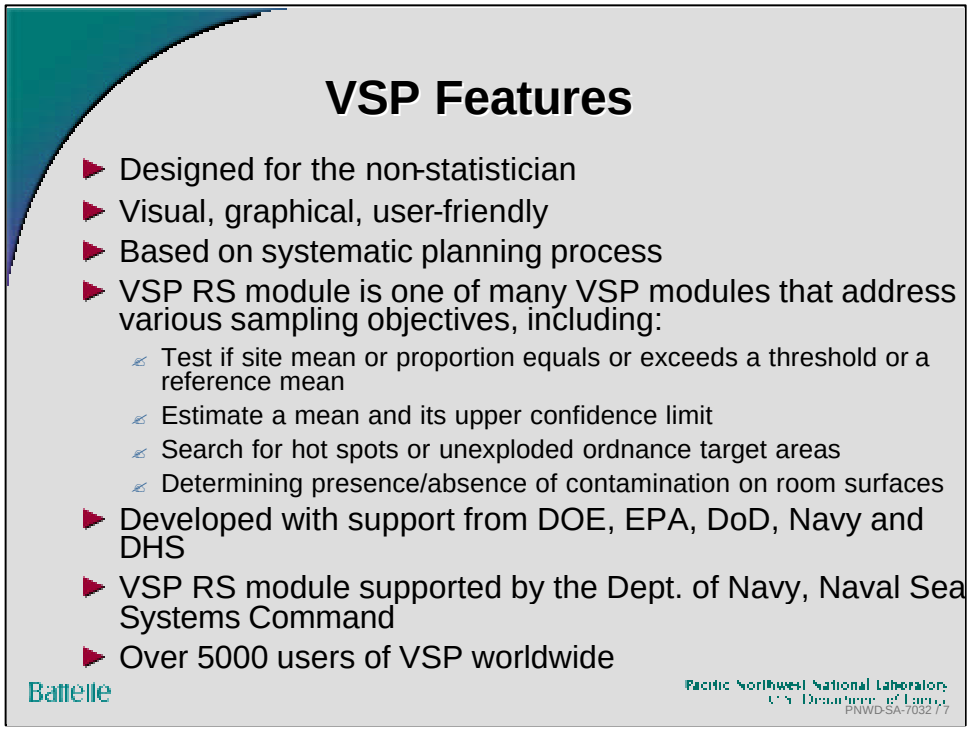




The Visual Sample Plan "Quick-Start Guide" that is automatically downloaded along with the VSP software provides very help instructions on use of basic VSP features.



The RS module of VSP differs from other VSP modules in that the number of samples per segment is fixed at 1 or 2. Other VSP modules compute the minimum number of samples on the basis of inputs (Data Quality Objectives) provided by the VSP user



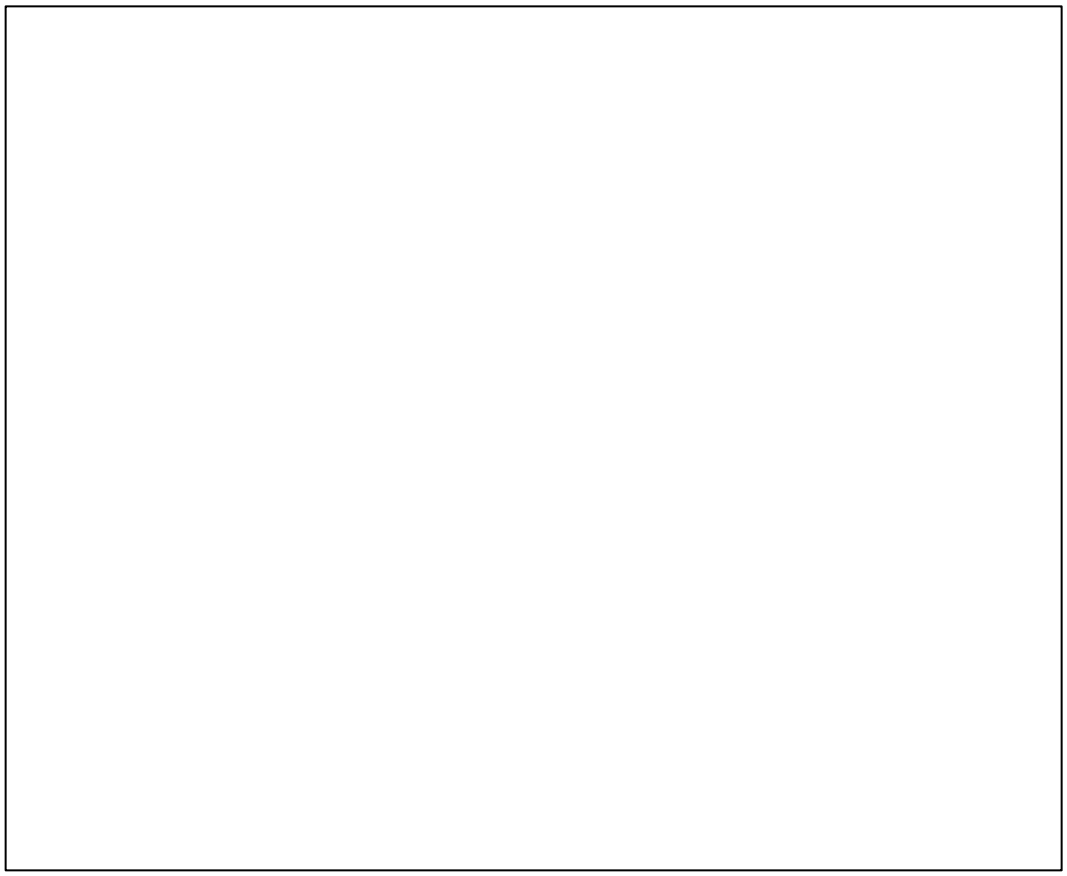
VSP provides both well known and novel sampling approaches:

- Simple random sampling
- Systematic grid sampling
- Sequential sampling
- Collaborative sampling
- Stratified sampling
- Rand-Set sampling
- Adaptive cluster sampling
- Continuous transect sampling
- Judgmental sampling
- Composite sampling along boundaries

The VSP User's Guide (Hassig et al, 2005) provides full details.

What are the Steps in Using the VSP RS Module?

1. Download, install and open VSP
2. Define the provisional range boundary
3. Specify sampling design inputs and constituents of concern
4. VSP divides boundary into equal-length segments
5. Collect two multiple-increment (MI) soil samples in 5 or more segments or at least 10% of segments; collect one MI sample in remaining segments
6. Measure the MI soil samples for explosives contaminants of interest: TNT, RDX and/or HMS
7. Enter data into VSP

Battelle

PNWD-SA-7032 / 8