HOW TO GUIDE:
Testing for Hydrogen Sulfide
Using Photographic Paper

Protocol from:
What You Will Need:

Materials (with links)

1) Ilford Multigrade IV RC Deluxe MGD.1M B&W Paper (35 sheets $18)

http://www.google.com/products/catalog?q=Ilford+Multigrade+IV+RC+Deluxe+MGD.1M+B%26W+Paper&hl=en&safe=off&prmd=imvns&bav=on.2.or.r_gc.r_pw.r_cp..cf.osb&bws=1047&bhh=706&um=1&ie=UTF-8&tbm=shop&cid=1635077024732872642&sa=X&ei=mTtzsC8Le0QHY2c2XDg&ved=0CG8Q8wIwAw

2) Glycerol: Glycerol and Glycerine are roughly the same compounds, so we will use Glycerine since it is more readily available. (8oz $1)

http://www.google.com/products/catalog?q=glycerin&um=1&ie=UTF-8&tbm=shop&cid=14151160970879363122&sa=X&ei=5LGmTsaCGer30gGJxuG3Dg&ved=0CGsQ8glwAw
3) Kodak Photoflo 200 (16oz $8)

http://www.google.com/products/catalog?hl=en&safe=off&q=kodak+photo+flo+200&bav=on.2,or.r_gc.r_pw.,cf.osb&biw=1047&bih=706&um=1&ie=UTF-8&tbs=shop&cid=14456853804540069997&sa=X&ei=x7KmTum8BOH10gGkw_WEDg&ved=0CF4Q8wIwAA

4) photographic fixing solution: Kodak Fixer; Powder. A general purpose fixer for film and paper.

Each pack makes one gallon.

http://www.bhphotovideo.com/bnh/controller/home?is=REG&sku=27603&Q=&O=&A=details

Fixing solution can be hazardous, so make sure to follow these directions when using it:


5) Containers for testing samples – Black film canisters have been found to work best.
Darkroom Setup

You will either need access to a darkroom or to set up your own. These are the supplies you will need if you are setting up your own darkroom (or if you are unable to use what is in the darkroom you are working in). There are a number of videos on You Tube about how to set up your own darkroom, and remember—for this assay we aren’t fully developing pictures but merely preparing and fixing photographic paper, so you don’t need an enlarger or any developing chemicals. You just need a dark space where you can mix solutions, dispose of them and hang test strips to dry.

- Gloves: household rubber gloves, or surgical gloves will do.
- Tongs for handling the strips:

http://www.ebay.com/sch/i.html?_nkw=film+canister


- Dish: You will need some kind of container to mix the two solutions in. Any deep plastic tray should work, or you can order one like this:

- Safelight:

http://www.google.com/products/catalog?q=darkroom+safe+light&cid=8561709536343219570&ei=zpB0TOXGcOisAe0xayhBg&ved=0CBQQrRI
Making, Using, and Setting Test Strips:

Making the Test Strips

1. In a dark room, cut black and white resin-backed photographic paper into strips.

2. Make the glycerol solution:

   2.1) Wear plastic gloves and use tongs while making this mixture and handling the strips. Work in a room with good ventilation.

   2.2) Make a 50/50 mix of water and glycerol in a tray
   Add 5 gram of Sodium Chloride (optional)
   Add 5 drops of surfactant Kodak Photoflo 200.
   (MSDS for Kodak Photo Flo 200)

3. Use plastic tweezers to place the strips face down in the glycerol solution (to reduce the effects of any light in the darkened room) for five minutes.

4. Remove the strips from the solution and let them drain onto a paper towel. Leave strips to drain for five minutes

5. Transfer strips to rack or pin up to dry in a dark room for twelve hours (we have been hanging them using clothes pins)

6. After 12 hours, in the dark room place the strips with tongs into containers for storage and testing. Replace container lids during storage. The samplers remain inactive until exposed to H2S-laden air.

7. Waste Disposal: If you are working in a school or professional darkroom, follow their procedures for safe disposal of the Photo Flo Mixture. If you are setting up your own darkroom, contact a local photography store or darkroom or local officials to discuss safe disposal of the mixture and the fixative solution you will make to fix the strips upon completion.
Using the Test Strips

Expose the samples in the field for a set length of time. Collect the samples.

Fixing the Test Strips

Once test strips have been exposed to H2S–laden air, the canisters containing the strips should be resealed so they can be fixed in a darkroom.

Gather up test strips and in a dark room fix them by:

1. Mixing up the fixative. We have tried

   [Image of fixative]

   [Image of Kodak Fixer]

   [Image of Kodak Fixer]

   http://www.bhphotovideo.com/bnh/controller/home?is=REG&sku=27603&Q=&O=&A=details” – Kodak Fixer for Black & White Film & Paper. This powder makes 1 Gallon (3.8L) of fixer.

   Put on gloves and follow the directions on the back of the packet: mix 3 L of water with the powder (not 3.8 L of water then adding the powder as I did on my first try). Stir the mixture gently until it the powder dissolves completely so the liquid looks clear. This took us about 10 minutes on the first try.

2. Place the strips into the fixer for five minutes.

3. Remove the strips from the fixer and wash the twice with cold water.
4. Leave the strips on a rack or hang them to dry for 12 hours. As they are now fixed they can be dried in light or in the dark.

5. The fixer is reusable so store it in a 1 gallon light safe jug. This should be poured in carefully using a funnel so you don’t splash it around too much. Wash skin thoroughly if you get any on you.