UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF
PREVENTION,
PESTICIDES
AND TOXIC
SUBSTANCES

June 14, 2011

MEMORANDUM

Subject: Efficacy Review for EPA Reg. No. 69529-2, Borasol WP;
DP Barcode: 388381

From: Tajah L. Blackburn, Ph.D., Microbiologist
Efficacy Evaluation Team
Product Science Branch
Antimicrobials Division (7510P)

To: Mark Suarez PM11/Samantha Hulkower
Registration Division

Applicant: Quality Borate Corporation

Formulation from the Label:

Active Ingredient(s)	% by wt.
Disodium Octaborate Tetrahydrate ($Na_2B_8O_{13}$)	98%
Other Ingredients.....	2%
Total.....	100%

I BACKGROUND

The product, BoraSol-WP (EPA Reg. No. 69529-2) is a registered insecticide. The current data package was submitted to support fungi, mold and mildew claims on wood and wood products. The data package contained two proposed labels (master label and the industrial label). Two studies were reviewed to support the proposed claims (MRID Nos. 483949-08 and 483949-01).

II USE DIRECTIONS

According to the proposed label, the product BoraSol-WP is (1) for protection and prevention treatment of wood against termites and other wood boring insects; (2) for prevention and control of fungi, mildew and mold on wood and wood products, and (3) for pressure treatment and dip diffusion treatment of wood and wood products by industrial applications. Directions on the proposed label provided the following instructions for the use and preparation of the product:

The product is recommended for wood materials in accordance with the specific treatment methods. BoraSol WP is effective for interior and exterior wood (and wood-foam composite structural components) that will be protected from rain and not in direct contact with soil. Type of wood include, but are not limited to, all types of lumber, logs, and plywood. This product is toxic to wood-destroying insects, but surface etching of treated wood may occur. Remedial and preventive treatment of wood can be performed by BoraSol WP powder. BoraSol WP 15% water solution or BoraSol WP 15% water solution with 1-3% Foaming agent. Each method of application depends on the target pests and the location of treatment.

<u>BoraSol WP Powder Application</u>

BoraSol WP can be applied as a dust using a dusting applicator available at most pesticide supply houses. Apply powders to surfaces at a rate of 2-12 grams/sq.ft. in a uniform coating (dependent on the target organism).

<u>Preparation of 15% BoraSol WP solution</u>.
A 15% aqueous solution is used for treatment. Gradually add 1.5 pounds of product to 0.75 gallons (3 quarts) of water for each gallon of treating solution that is required. Add water to bring the final volume up to a gallon. Mix until dissolved. Please see the table below for mixing instructions for various treatment areas. Using warm water will hasten the dissolution process.

BoraSol WP Mixing Table

Surface Area (sq. ft.) for Treatment	200	1000
Final Volume	1 gallon	5 gallons
Water (gallons)	0.75+	3.75+
Water (lbs)	7.5	37.5
BoraSol-WP (lbs)	1.5	7.5

Preparation of 15% BoraSol WP Solution with Foaming Agent

BoraSol WP can also be applied as a wet foam for wall void areas. BoraSol WP is compatible with most foams commercially available. Generally, 2-3 fl oz. of the foaming agent is required for each finished gallon of the 15% BoraSol WP. The amount of Active Agent per gallon of treatment solution is not reduced. Substitute the foaming agent for the corresponding volume of water. In many cases repellency of the target organism is achieved. See mixing instructions for various suppliers of foaming agents and equipment.

Remedial Application of BoraSol WP Solution to Infested Wood

A 15% BoraSol WP Solution Treatment is used for remedial control of listed organisms attacking wood. For control of termites, carpenter ants, and wood decay fungi, apply the 15% aqueous solution by brush or spray until surface is thoroughly wet (1 gallon per 200 square feet). For adequate loading of the active ingredient per AWPA specifications, treatment must be conducted a second time (or even a third time for Dampwood or Formosan Termites) after the surface has dried. A single coat of the 15% solution at 200 sq. ft. /gallon, will give 0.136 lbs/cu. ft. of the active ingredient to 0.6 inch depth of the sprayed surface. To increase the penetration of the solution, spray wood with clean water. Apply the 15% solution when the wetted wood is dry to the touch.

The 15% solution with foaming agent can be used for remedial control of wood destroying organisms such as termites, Carpenter ants, and wood decay fungi. Inject the foam inside wall cavities or overhead surfaces with a delivery wand such that all wood surfaces in a cavity are contacted with the foam. For treating infected wood thicker than 2 inches, the solution or powder must be injected into the wood in addition to spraying of the surface area.

Protection of Wood from Fungal Attack (mold, algae, mildew)

BoraSol WP can be mixed with either BoralSol Plus (polyphase EC 17) or BoraSol MC (Maquat LC 12S—50%) for the purpose of increased protection of wood from fungal attacks. BoraSol Plus is used in Pressure Treated Applications and large tanks of Dip Solution. BoraSol MC is used in Spray, Brush, or Dip Diffusion applications in small tanks (< 100 gallons). For pressure or dip diffusion treatment of wood, add 0.6 gallons (5 lbs) of the BoraSol Plus to 1000 gallons of borate treatment solution. Borate solutions will vary in concentration (1.5 -20%) according to the specie of wood being treated in pressure treatment. Dip solutions can vary from 16% to 29% BoraSol WP. Wood treated for fungal protection can be used in new construction or on wood in existing structures which is protected from rainfall. For lumber treated by spray, brush or dip diffusion in small tank applications: Use 3-6% by volume of BoraSol MC in 15% BoraSol WP solution (e.g. for a 3% BoraSol MC solution, add 3.9 fl oz of BoraSol MC to 1 gallon of 15% BoraSol WP (1.5 lb BoraSol WP/ gallon). Apply treatment solution by spray or brush to the point of runoff. Coverage will vary with specie of wood and texture of wood. Coverage can be 200-500 sq. ft. /gallon. For effective inhibition of mold and fungi, the work surface must be completely treated. No voids are permitted for complete control of mold and fungi. Allow treated surfaces to dry after treatment. Maintain treated dried wood surfaces away from rain in a protected environment in order to prevent leaching of active ingredients. Spraying and/or brushing are effective methods of application in

either existing structures or new construction. In existing structures, the conditions causing the mod should be remediated before any pesticidal treatments are initiated. Drywall surfaces should be removed along with any insulation that has been through a catastrophe such as a flood, roof leak or plumbing leak. Wood studs or structures behind such damaged areas should be cleaned and then treated with a BoraSol WP and BoraSol MC solution before addition of the insulation or finished dry wall. For protection against insects in addition to fungal attack, apply two coats of 15% BoraSol WP. The first coat will be 15% BoraSol WP at a rate of 1 gallon/200 sq. ft. After allowing the first coat to dry, apply the second coat with 15% BoraSol WP and 3% BoraSol MC at a rate of one gallon/ 200 sq. ft.

III SYNOPSIS OF SUBMITTED INFORMATION

1. MRID No. 483949-08, "The Use of Diffusible Preservatives for the Prevention and Control of Wood-Boring Beetles, Carpenter Ants, and Decay Fungi" authored by Vincent Opaskar. Report Completion date—January 6, 2011.

The information provided was compiled to demonstrate the use of borate as a fungicide. This submission includes the study "The Use of Diffusible Preservatives for the Prevention and Control of Wood-Boring Beetles, Carpenter Ants, and Decay Fungi" cited to support borate usage claims. The following excerpts within the articles relate to the use of borate as a fungicide:

- Limited use due to the infrequent occurrence of *Poria incrassate*, the water-conducting fungus, has shown 100 percent control on this fungus in both residential and commercial structures.
- Only one group of fungi, *Poria spp.*, routinely receives some borate treatment as part of their control. *P. incrassate* is often called the water-conducting fungus, or dry rot.
- The contact fungicidal properties together with their ability to readily diffuse in water make the borates ideally suited to control this aggressive fungus.
- The product that best suited this needs was a borate called Mop Up. Labeled for cockroach control by adding to mop water for commercial kitchens, it was able to control the *Poria spp.* infestation.
- Because *Poria* grows through expansion joints in slab basement, and up through voids or the old mortar joints of piers and pilasters, these supports are drilled and treated with borate solutions in the same manner as termite treatment. Wood members near the infestation are treated by surface application. Apparently the borates are translocated some distance through the fungus, as Terminix has experienced excellent success in controlling *P. incrassate* using this technique.
- Manufacturers need to devote more research toward borates as fungicides and corresponding application techniques and recommended rates.

2. **MRID No. 483949-01, Integrated Protection Against Lyctid Beetle Infestations. IV. Resistance of Boron-Treated Wood (*Virola spp*) to Insect and Fungal Attack", by Vincent Opaskar. Report Completion date—February 11, 2011. Study was conducted by USDA Forest Service, Southern Forest Expt. Station, Study Completion date—1996. Study Authors Lonnie Williams and Terry Amburgey**.

This paper tested dip diffusion Banak lumber loaded with Disodium Octaborate Tetrahydrate. Tests included wood infecting insects (Termites and Lyctid Beetles), *Gloeophyllum trabeum*, brown rot and soft rot fungi. The % weight loss decreases linearly from 0% BAE to 0.53% BAE, where the % weight loss maintains its value of 10%. However, the Banak wood test pieces did not demonstrate any soft-rot fungi decay resistance. The tested specie is very susceptible to soft-rot fungi decay. The authors summarized: "Brown-rot decay fungi; test results with both lumber and molding samples show that concentration of 0.4-0.5% BAE protect wood from decay by *G. trabeum*. Harrow *et al* found that toxic loading of boric acid was between 0.5 and 0.9 for this fungus, and Baechler and Roth *et al* reported toxic limits of 0.8 to 0.124 lb/ft^3. Findlay notes that no brown-rot fungi have been found to be unusually resistant to boron.

III CONCLUSIONS AND LABEL RECOMMENDATIONS

1. The proposed claims against brown rot, white rot, mold and mildew prevention and remedial treatment of wood are unacceptable. Data (and/or rationale to explain why this data requirement is not testable, etc.) must be generated and submitted for Agency review when prevention claims extend beyond 7 days. Until this data is provided to the Agency, these claims must be removed from the proposed label. Claims for brown rot and white rot control are acceptable.

2. In those situation where fungi is listed, brown and white rot must be included to define the types of fungal species for which the claims are extended.