

US EPA Releases Final External Peer Review Comments On 1,4-Dioxane IRIS Assessment

The US EPA has released the final external peer review comments on its Integrated Risk Information System (IRIS) toxicological review of 1,4-dioxane. The release follows an external review workshop held March 19, 2012, and public comment period. A PDF of Consolidated Comments from the External Peer Review is available at http://cfpub.epa.gov/ncea/iris_drafts/recordisplay.cfm?deid=235370.

The compound 1,4-dioxane is used as a solvent, cleaning agent, chemical stabilizer, and adhesive agent; 1,4-dioxane is also used in surface coatings and chemical manufacturing. This compound may also occur as a trace contaminant in cosmetics and personal care products. The US Department of Health and Human Services considers the substance as "reasonably anticipated to be a human carcinogen" and has indicated that high exposure levels can cause kidney and liver damage.

The assessment will be revised, taking comments into consideration. This assessment will then undergo a final internal review by US EPA and other federal agencies and White House offices. After completing the review, the assessment will be posted to the IRIS database. ■

Coal Production in United States Was Up For 2011



In 2011, US coal production increased to 1.094 billion short tons. That is an increase of 0.9% over 2010 levels. This is the third straight year that US coal production has increased.

US coal consumption, however, decreased in 2011. Coal consumption in the electric power sector in 2011 was lower, primarily because of warmer winter temperatures in the US and from strong competition in the natural gas market.

The US consumption decrease was offset by rising coal exports to Asia and Eu-

rope. US coal exports were up in 2011 because of supply disruptions in Australia, Indonesia, and Colombia. More than half of all US coal exports went to Europe because South Africa is shifting steam coal exports from Europe to Asia, and Russia and Colombia had limited capacity to meet the European demand.

Exports to South Korea, China, Japan, and India accounted for 25% of all coal exports. Japan uses coal for electricity generation and steel manufacturing. Japan's coal use increased after the Fuku-

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shima Daiichi nuclear accident in 2011. US exports of metallurgical coal accounted for 65% of all coal exports last year: 18 million short tons of metallurgical coal were sold overseas at an average price of \$181 per ton. ■

Laboratory News

Analytical Perspectives Acquired by SGS

SGS announced in April 2012 that it acquired in full the assets of Analytical Perspectives of North Carolina, LLC (AP) in Wilmington, North Carolina. These two companies combined bring extensive analytical expertise and common synergies as they relate to ultra-trace organics.

Scranton Laboratory Fined \$20,000 and Surrenders Accreditations

In May 2012, the Pennsylvania Department of Environmental Protection's (PA DEP's) Laboratory Accreditation Program announced it reached an agreement with Northeastern Environmental Laboratory (NEEL) of Scranton, on a civil penalty for violating the Laboratory Accreditations Act.

The laboratory will pay a \$20,000 fine and voluntarily surrender the majority of its accreditations for drinking water and wastewater management and testing. The agreement is the result of several violations found at NEEL during non-routine visits in September 2011, including failure to properly train staff; failure to oversee and supervise testing of water samples; failure to maintain records; and failure to adhere to proper collection, receipt, and handling of samples.

The laboratory's certificate of accreditation expired on April 1, 2012, and the business subsequently notified PA DEP that it will not seek re-accreditation. ■

Are You Really Prepared and Equipped To Handle Your Spill Response?



As a result of the Deepwater Horizon Incident in 2010, there has been an increase in spill drills by Oil and Exploration companies operating in the Gulf of Mexico and in other deepwater areas. There are many guidance documents and resources that are available to usher spill drill responders through the drill exercises to prepare them for a potential event, including company-specific documents. When it comes to sample collection, sample analysis, and data management, however, the federal and state guidance documents do not offer much detail on how to perform these activities.

Environmental Standards personnel have provided emergency response to some of the nation's largest environmental incidents over the past decade. Most recently, Principal Chemist Ruth Forman, CEAC, contributed to a sample guidance document prepared by the US Coast Guard. Based upon collective experience from actual emergency response events and from participating in spill drill activities and document preparation, Environmental Standards personnel have observed that industrial companies are not equipped or prepared to handle a large-scale unplanned event relative to sample collection, sample analysis, and data management - the very topics that are not usually well defined in the federal and state guidance documents.

In the early days of an emergency response, decision-makers desire to have data as soon as possible. While it is easily recognized by many of the responders to an unplanned event that environmental samples should be immediately collected, initial samples that are collected typically cannot withstand legal scrutiny over time and/or do not provide decision makers with needed information. If you do not currently have standardized procedures and quality documents related to sample collection and analysis, a database platform to maintain the field and analytical data, or personnel that provide quality assurance and data management services, you are not equipped or prepared to handle a larger-sized spill response and you will be behind the curve should an unplanned event occurs.

Should you be interested in discussing sample collection, sample analysis, and/or data management preparedness, please contact Principal Chemist Ruth Forman at 610-935-5577. ■

Barcoding – A Quick Win to Reduce Errors and Improve Automation

Barcoding is increasingly recognized as a best-practice in environmental sampling and data management. Evolving from an arrangement of parallel lines to more complex geometric patterns, barcodes carry data about the objects to which they are attached. Through a process referred to as automatic identification and data capture, scanning labels eliminates the need for manual entry of data. The benefits are obvious – improved accuracy, speed, and ability to automate processes. Barcoding, however, is only possible for those applying information technology and centralized data management solutions to their sampling operations. Environmental Standards promotes the successful application of barcode systems for clients as well as its own workflow management and inventory control. Barcoded Chain-of-Custody forms and physical samples collected in the field followed by scanning upon laboratory receipt provides a strong, accurate handshake ensuring data quality.

The barcode was originally developed at Drexel University in the 1940's and patented in 1952 for use by grocery stores. Due to poor scanning technology, barcoding systems were not introduced for commercial use until 1974 and quickly became indispensable across the retail industry. Today, the technology is applied in fields ranging from transport, ticketing, and medical records management through patient care and materials handling. Portable scanning devices have greatly expanded the range the applications. The environmental industry has embraced barcoding as the value

of easily accessible, quality data is recognized as critical to cost reduction and risk management. Enterprise-wide data management solutions implemented by Environmental Standards based on business rules, standards, and process make barcoding a “quick win” in providing return-on-investment.

Mapping messages through barcodes utilizes symbolism. This involves encoding characters, start and stop markers, and the calculation of a checksum. While reducing data entry time is a significant business consideration, equally important is reduction of errors. Dun and Bradstreet (2012) suggest the cost of correcting errors is approximately 100 times the cost to prevent errors. A widely estimated accuracy of one error per three million characters demonstrates the value of barcoding beyond typing or any other form of manual data entry. Studies in fields such as medical administration have demonstrated reduction in errors of 67% within four months of implementing barcoding systems. In one pilot conducted by the National Institute of Health, barcoding reduced medical testing errors by 95%. These heavily scrutinized activities serve as examples to the environmental industry where data quality problems often involve significant cost and liability long after initial activities



are completed and errors have gone undetected.

Barcoding is part of a larger solution. Benefits are derived when an environmental information management system is applied to capture, track, and manage data through a defined life cycle. Environmental Standards has applied barcoding to support sampling, laboratory sample management, tracking chains-of-custody and completeness, through the management of hardcopy data packages and validation. Barcoding has also been applied to inventory and tracking of sample materials in support of litigation. Implementation is no longer limited to an office environment. Barcodes can be printed, applied, and scanned in the field to ensure quality from the beginning of a process through final delivery and every step between. ■

Did You Know?

According to the latest mineral statistics from the United States Geologic Survey:

- A telephone contains over 40 different mineral materials; a television set has about 35, and an automobile about 15.
- Of the approximately 193,000 metric tons of gold discovered, 62% is found in just four countries on earth. All the gold discovered thus far would fit in a cube, 22 meters on a side.

- Of the approximately 1,740,000 metric tons of silver discovered, 55% is found in just four countries on earth. All the silver discovered thus far would fit in a cube, 55 meters on a side.
- According to the Minerals Information Institute, at today's level of consumption, the average newborn infant will need a lifetime supply of 854 pounds of lead, 776 pounds of zinc, 1,319 pounds of copper, 32,980 pounds of iron, 21,418 pounds of clays, 31,040 pounds of salt, and 1.71 million pounds of stone, sand, gravel, and 72,994 pounds of cement.

- The fineness of jewelry gold is stated as the number of parts in twenty-four that are gold. Thus, 24 karat gold is pure gold; 12 karat would be an alloy that is half gold and half copper or other metals.
- Fool's Gold can be one of three minerals; the most common mineral mistaken for gold is pyrite, chalcopyrite may also appear gold-like, and weathered biotite mica can mimic flake gold. ■



US EPA Announces \$69.3 Million to Clean Up Contaminated Sites and Revitalize Communities

Many of our clients are aware that Environmental Standards is well known as one of the country's premier brownfield redevelopment firms. We continue to provide services to the newest group of grant recipients under US EPA's brownfields program. This year, US EPA announced \$69.3 million in grants for new investments to provide communities with funding necessary to clean and redevelop contaminated properties, boost local economies, and create jobs while protecting public health.

The City of Waynesboro, Virginia, is one of the 245 grant recipients from 39 states across the country. Waynesboro has received two Brownfields assessment grants, totaling \$400,000. The Community-wide Hazardous Substances grant funds will be used to conduct six phase I and two phase II environmental site assessments. The Petroleum grant funds will be used to conduct seven phase I and two phase II environmental site assessments. In addition, grant funds will be used to conduct cleanup planning and community outreach activities.

There are an estimated 450,000 abandoned and contaminated waste sites in America. In 2011, EPA's brownfields program leveraged 6,447 jobs and \$2.14 billion in cleanup and redevelopment funds. Since its inception, US EPA's brownfields investments have leveraged more than \$18.3 billion in cleanup and redevelopment funding from a variety of public and private sources and have resulted in approximately 75,500 jobs. More than 18,000 properties have been assessed, and over

700 properties have been cleaned up. Brownfields grants also target under-served and low income neighborhoods – places where environmental cleanups and new jobs are most needed.

If you are interested in learning more about Environmental Standards' award-winning brownfields redevelopment programs, please call Gerry Kirkpatrick at 610.935.5577. ■



The former Ashley & Bailey Silk Mill was redeveloped as the Turkey Hill Experience with the assistance of a US EPA Target Assessment Brownfield Grant administered by the Lancaster County Planning Commission. The brownfield site, which had been vacant for more than 25 years, is located in Columbia, Lancaster County, Pennsylvania.

Fishing the Shale Boom, Part 1

Article written by Senior Consulting Geoscientist David Lehmann, an avid fisherman. Parts 2 and 3 will be covered in future issues of The Standard.

Unconventional plays are hot. They are bringing prosperity and jobs to rural America, to former rust belt towns, and to areas that have not seen a natural resource boom in decades, centuries, or ever. But along with the booms come "not enough of's." Not enough housing.

Below: A nice musky from the upper Susquehanna River. Photo courtesy of LD Guide Service, New Albany, Pennsylvania.



Not enough office space. Field services? Playing catch up. Transmission lines? You better have some storage volume available on your leases to hold you until pipelines are permitted and constructed.

Is there anything in great supply with the unconventional plays besides the petroleum product itself? Yes. The booming unconventional plays are centered on some of the best freshwater fishing resources in the world. So after a long week in the field, you may not be able to go to your local dream home. Five star restaurant? Not in most of the play footprints. You may not even have adequate shopping available. But you can go fishing in style.

A survey of 10 of the hot shale plays demonstrates the preposterous piscatorial bounties that they offer.

Marcellus Shale Smallmouths, Trout, and Panfish: In the northern portion of the Marcellus play, the Susquehanna River looms large as one of the historic smallmouth bass fisheries in the East. Although some wade fishing is available near mouths of tributaries and islands, a canoe, kayak, or flat-bottom boat will afford you better access to productive stretches of the river. Where there is sufficient current, such as in riffles where tributaries dump into the river, dead drifting tubes on 1/16 to 1/8 ounce jig heads can be extremely productive. Along steep banks and at deeper structure, many of the locals prepare crankbaits and live bait. Reportedly, walleye fishing looks to be quite productive this year, and there is always a chance of latching into a Susky musky. Access to the river is excellent with well over a dozen public boat launches in Bradford and Wyoming coun-

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Final Rule - Procedures for the Analysis of Pollutants Under the Clean Water Act

Recently, the US EPA released a final rule modifying certain testing procedures and sampling requirements used for compliance under the Clean Water Act's (CWA) National Pollutant Discharge Elimination System (NPDES) program. Modifications included but were not limited to:

- New methods for testing for oil and grease, metals, pesticides, microbiologicals and organics.
- New standard methods for testing for listed pollutants, including arsenic and selenium, inorganic ions, oil and grease, ammonia, mercury, and phosphorus.
- New standard methods for testing for new pollutants including Nonylphenols and Bisphenol A.
- Revisions concerning the storage of Whole Effluent Toxicity (WET) water samples.

- Changes concerning the review and approval of alternative test procedures, approved methods to address matrix interferences, and the definitions for total residual chlorine and free available chlorine.
- Specification of "essential" quality control elements for use in conducting analyses for CWA compliance monitoring.
- Deferral of action on Method 1668C, the low-level detection method for PCBs.
- Revisions concerning Quality Assurance and Quality Control Procedures.

The changes took effect June 18, 2012. A copy of the *Federal Register* notice announcing the new rule can be found at <http://www.gpo.gov/fdsys/pkg/FR-2012-05-18/pdf/2012-10210.pdf>. ■

2012 Summer Conferences

Kentucky Oil & Gas Association (KOGA) Annual Meeting, June 19-21, 2012, Lexington, KY. Environmental Standards exhibited.

American Industrial Hygiene Conference & Expo (AIHce), June 16-21, 2012, Indianapolis, IN. Technical Director of Chemistry/Principal Rock J. Vitale, CEAC, presented "Generating Meaningful Environmental Information in the Midst of an Emergency Response."

Shoreline Cleanup Assessment Techniques (SCAT) Training Session, June 18, 2012, Philadelphia, PA. Principal Chemist Ruth L. Forman, CEAC, and Director of Information Technologies/Principal Dennis P. Callaghan presented "Unifying the Sampling, Analytical, and Data Management Quality Systems for An Incident."

Laboratory Association of New Hampshire (LANH) Annual Conference & Trade Show, June 20, 2012, Portsmouth, NH. Rock Vitale presented "Purchasing Analytical Services Method Flexibility and the Need to Educate the Analytical Buyers."

V.M. Goldschmidt 2012 Conference, June 24-29, 2012, Montreal, Quebec. Rock Vitale presented "Chemical Characterization and Magnetic Susceptibility of Coal Fly Ash."

Virginia Oil & Gas (VOGA) Summer Meeting, June 27-29, 2012, Virginia Beach, VA. Principal Geoscientist Gerry L. Kirkpatrick, P.G., presented "Cost Balancing and Data Quality When Addressing Environmental Liabilities."

Louisiana Oil & Gas Association (LOGA) Legacy Lawsuit Seminar & Legislative Recap, June 27, 2012, New Orleans, LA. Representatives from Environmental Standards attended.

West Virginia Independent Oil & Gas Association (IOGAWV) Summer Meeting, August 5-7, 2012, White Sulphur Springs, WV. Representatives from Environmental Standards will attend.

National Environmental Monitoring Conference (NEMC), August 6-10, 2012, Washington, DC. Rock Vitale will present "Analytical Considerations During Natural Gas Fracturing Activities." ■

Pennsylvania Introduces Bill to License Soil Scientists



Senator Mike Brubaker (R-Lancaster) recently introduced Senate Bill 1506 requiring soil scientists to be licensed and registered in Pennsylvania. The bill would add soil scientists to the list of professions that must be licensed and registered under the Engineer, Land Surveyor and Geologist Registration Law. The proposed legislation would provide registration and licensing of soil scientists in training and professional soil scientists. Bill 1506 defines a professional soil scientist as "an individual licensed and registered under the laws of the Commonwealth to engage in the practice of soil science. A professional soil scientist may not practice soil science unless licensed and registered as a professional soil scientist as defined and set forth in the act." Senate Bill 1506 states that "the practice of soil science includes, but is not limited to, investigating and evaluating the interaction of water, soil, nutrients, plants and other living organisms that are used to prepare soil scientists' reports for subsurface ground absorption systems, including infiltration galleries; land applications of residuals such as biosolids, septage and other wastes; spray irrigation and drip dispersal of wastewater; soil remediation at conventional rates; land application of agricultural products, processing residues, bioremediation and volatilization; soil erodibility and sedimentation; soil drainage classification, soil mapping and taxonomic classification; and identification of hydric soil and redoximorphic features." The proposed bill can be reviewed here: <http://www.legis.state.pa.us/cfdocs/billinfo/billinfo.cfm?year=2011&sind=0&body=S&type=B&BN=1506>. ■

New Federal Regulations Affecting Oil and Gas Well Installations

During Spring 2012, three new federal regulations affecting oil and gas well installations - two proposed rules and one final rule - were published in the *Federal Register*.

On March 30th, the US EPA Region 6 proposed a National Pollutant Discharge Elimination System (NPDES) general permit which would regulate discharges from oil and gas wells from the Coastal and Stripper subcategories. The permit allows for specified discharges of:

- Some produced water (derived from the Carizo/Wilcox, Reklaw, and Bartosh Formations) generated at stripper wells.
- Deck drainage.
- Formation test fluids.
- Sanitary waste.
- Domestic and miscellaneous waste.

Prohibited discharges include drilling fluid, drill cuttings, produced sand and well treatment fluids, completion and work-over fluids, and dewatering effluents from reserve pits.

Significant changes from the current general permit rule include the deletion of new source exemptions, the addition of requisite toxicity testing to hydrate control fluid discharges, the inclusion of spill prevention best management practices, and a revised definition of "operator."

On April 17th, the US EPA issued final amendments to air regulations for the oil and gas industry. The final rules include air standards for hydraulically fractured gas wells, as well as some other oil and gas facilities that had not previously been



addressed under the air regulations. A key stated goal of the new regulations is an anticipated 95% reduction in volatile organic compound emissions from fractured wells through requisite "green completions." In a green completion, special equipment is installed at the well to separate gas and liquid hydrocarbons from the flowback, which can reduce the amount of natural gas being vented to ambient air. Although not previously required by federal regulations, requisite green completions have been implemented by some state regulatory agencies (Wyoming and Colorado) and within some municipalities (Fort Worth and Southlake in Texas). According to the US EPA, the cost of installing green completions will be superseded by the increased capture and sale of natural gas and condensate.

On May 6th, the Bureau of Land Management (BLM) published draft hydraulic fracturing regulations for oil and gas development on BLM-administered public lands.

The proposed rule was the culmination of a series of public forums in North Dakota, Arkansas, and Colorado. The BLM rule will require disclosure of fracturing fluids, including each chemical and additive trade name and purpose, as well as the concentration of each ingredient. Limited trade secret protection is provided by the rule. The rule requires mechanical integrity testing and cement bond logs to ensure well integrity, as well as reporting on volume of fracturing fluids, proppants, chemicals and water, pressures, volume of recovered flowback fluid, and methods used for managing and disposing of the flowback fluids. BLM's proposed rule is consistent with the American Petroleum Institute's (API) October 2009 guideline for well construction and well integrity. Current BLM regulations governing relevant oil and gas well operations on public lands are more than 30 years old and were not written to address modern hydraulic fracturing activities. ■

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ties. And, if New York State gets their act together to facilitate shale gas development, the outstanding fishing continues up to the Susquehanna's confluence with the Chemung River.

If you find yourself transecting Pennsylvania to reach the western PA portion of the Marcellus play, you will be driving through exceptional trout fishing country. Pine Creek and the "Grand Canyon of the East," north of Williamsport, offers spectacular scenery to go along with hungry trout, but perhaps the most challenging and rewarding trout fishing in the area

can be had in Spring Creek in Centre County. There is public access and a nice stretch of wadable stream at Fisherman's Paradise, near Bellefonte. Dry fly hatches are generally good, but there are times when nymphs - and nothing but nymphs - will produce. These are well educated fish, but in the fall, some sloppy big browns can fall prey to large streamers. Even in the summer, waders with felt soles are recommended for this slick, cold limestone stream.

Small lakes, such as 244-acre Cross Creek Lake in Washington County, offer some of the best fishing opportunities in the western PA Marcellus play.

Cross Creek Lake contains a ridiculously healthy population of sunfish, as well as one of the best largemouth bass fisheries in western PA. In a recent survey conducted by the Pennsylvania Fish and Boat Commission, 68% of 927 sunfish measured were over seven inches, and 56% of over 1,100 crappie landed were over nine inches. The lake record for largemouth is nearly nine pounds—very respectable for a northern strain - and good numbers of fish between 1 and 5 pounds are reported. Points are favorite structure and buzzbaits and floating soft plastics have local followings as favorite lures. Outboard motors used on the lake must be 10 HP or less.

Health & Safety: It Could Be Worse

In 1997, the Zambia government sold a number of unproductive copper mines to the Chinese. These mines were plagued with poor production for decades. After a substantial investment by the Chinese owners, the mines are making a significant comeback. The copper prices have moved the Zambia economy up from low to low-middle class (World Bank, 2011). The creation of jobs put people to work and food on the tables of hundreds of families. The financial stability, however, did not come without costs.

Since 2001, there have been an average 15 mining deaths per year. The workers are subjected to 12 hour days, compared to the 8-hour days mandated by the labor unions. The ventilation systems are antiquated, leading to an increase in serious lung diseases and the employees are working with damaged personal protective equipment (PPE). Although countless complaints have been brought on behalf of the workers, the conditions are very slow to change. The Human Rights Watch reported in 2011 that workers are told "You'll be fired if you refuse." It is difficult for many of us to perceive working in dangerous situations day in and day out knowing our families will starve if we complain. There are safety inspec-

tors who work on behalf of the Zambia government; only 13 of the 28 inspector positions are filled. With half the number of field inspectors, far too many work environments will be slow to change, if it all.

In Butuan City, Asia, 17 women recently died when the garment factory in which they were working (and living) was destroyed by fire. It was reported that workers were concerned about sleeping in the factories, but were more concerned for their jobs (UCA news.com). It is common practice for factory workers in Asia to travel long distances for employment and to reluctantly accept the poor conditions to keep their jobs. Clearly, safety and health measures have been viewed as irritating barriers to company profits.

In Europe, the financial crisis has brought the work place incident rate for stress-related disorders to an all-time high. The rate is expected to rise 80% over the next 5 years; many researchers say that number will be closer to 87%. The Greeks have an excellent health care system yet report an 83% increase in stress, due primarily to their financial conditions. For comparison purpose, the Norwegians have it made when it comes to work. Norwegians have the least stress (16%) and have abundant natural resources;

the unemployment rate in Norway currently is 3.6%.

From the early days of the labor unions, the American workers have had a voice in their employment practices. That is not to say every piece of equipment was pristine and systems never failed. On the contrary, issues such as asbestos poisoning, mercury poisoning, and poor manufacturing equipment killed or injured thousands of workers.

With the establishment of OSHA and the OSH Act of 1970, employers became accountable for the health and safety of their workers. The Federal Government continued to mandate a safe workplace through training, education, outreach, and assistance. Today, employees are encouraged to report workplace hazards that go unresolved by their employer directly to the local OSHA office. Additionally, workers may do so confidentially and with the legal protection of the Federal Government if the employer takes negative action against them. Certainly, we cannot eliminate every workplace hazard; firefighting and underground mining come to mind. We can, and are, working much safer than our predecessors and working safely for the right reasons. ■

Volunteering for Earth Day

On Saturday, April 28, 2012, Angela Powley, a geoscientist at Environmental Standards, volunteered in a family-focused Earth Day event hosted by the Schuylkill Center for Environmental Education; she conducted demonstrations and lead discussions around that demonstration. Ms. Powley also represented the Society of Women Environmental Professionals (SWEP) of Greater Philadelphia. Ms. Powley resides on the Board of Directors and chairs the volunteer and outreach committee for SWEP.

A demonstration geared toward informing children about the physical aspect of oil releases in water environments and the materials used during cleanup efforts was presented by Ms. Powley. By utilizing popcorn oil and tap water to exhibit a potential oil release, she gained the children's interest as well as the interest of their parents. The children actively participated in the oil release cleanup process by choosing which method they thought would be the best way to clean up the oil - gauze pads, cotton balls, or diluted liquid dish soap (dispersant). This demonstration succeeded in its mission to engage children in an activity that peaked their interest in science. ■



Angela Powley (left) demonstrated oil cleanup efforts during the Earth Day event.



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