MINING DEVELOPMENTS

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Treasury Metals to raise $4M to advance Goliath Gold Complex

Treasury Metals (TSX:TML) has announced a private placement for up to $4 million so it can advance the Goliath Gold Complex in Ontario.

The company stated in a news release that the funds will be used for exploration and development activities, including permitting, community consultations and technical studies to support these activities.

The offering will include up to 28.6 million units at a price of 0.14 per share, while each unit will consist of one common share in the capital of the company and one-half of one common share purchase warrant.

It is expected that the offering will close by Dec. 14.

The Goliath Gold Complex includes a prospective 65-kilometre trend across a 330-square-kilometre land package. Under the land package are three distinct projects in the Wabigoon-Greenstone Belt in northwestern Ontario.

Notably, the company's land package is adjacent to the Trans-Canada highway that is midway between Thunder Bay, Ont., and Winnipeg, Manitoba.

As it currently stands, the project is at the exploration and development stage. It also has resources of 112,400 ounces of measured and indicated gold and 352,200 ounces of measured and indicated silver as well as 75,000 ounces of inferred gold and 92,000 ounces of inferred silver.

Treasury Metals is a gold-focused company with assets in Canada, including its Goliath Gold Complex.

Shares of Treasury Metals are unchanged at C$0.145.

Iron-ore eyes fifth weekly gain despite China intervention

The most-traded January iron ore on China's Dalian Commodity Exchange (DCE) DCIOcv1 ended daytime trade 0.61% higher at 986.5 yuan ($136.80) a metric ton.

The benchmark December iron ore SZZFZ3 on the Singapore Exchange climbed 0.88% to $134.35 a ton, following a 1.15% drop in the previous session.

The persistent strength in the price of the key steelmaking feedstock came after moves by Beijing to revive its debt-ridden property sector, the country's largest steel consumer.

China may allow banks to offer unsecured short-term loans to qualified property developers for the first time, Bloomberg News reported on Thursday.

This came after Chinese regulators are reportedly drafting a list of 50 real estate developers eligible for funding.

This has offset some losses following the latest government intervention.

China's state planner said it would closely monitor changes in the iron ore market and further tighten supervision of spot and futures trading in its latest effort to curb a price rally, leading to a price drop on Thursday.

"Iron ore prices are likely to consolidate in the short run amid the joint impact of favorable and unfavorable factors," analysts at Everbright Futures said in a note.

Other steelmaking ingredients strengthened on supply disruptions, with coking coal DJMcv1 and

tainless steel SHSScv1 gained 0.92%.coke DCJcv1 on the DCE up 3.87% and 3.29%, respectively.

Some coal mines in Lvliang city in north China's Shanxi province, its top coal production hub, temporarily suspended production due to intensified safety checks, consultancy Mysteel said, fanning concerns about reduced supply in the near term.

Steel benchmarks on the Shanghai Futures Exchange were driven up by higher raw materials. Rebar SRBcv1 added 0.66%, hot-rolled coil SHHCcv1 rose 0.85%, wire rod SWRcv1 climbed 1.3% and s

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Contributions
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DIESEL QUALITY AND ITS IMPORTANCE

When determining diesel quality, it is important to use a laboratory that employs the correct test methods as dictated by the standard. It is also important to use a laboratory that is accredited by SANAS 17025 (South African National Accreditation System) and SABS ISO 9001. This ensures that the tests are carried out correctly, quality standards are met, and the results are reliable.

The quality of the diesel in South Africa is often a topic of hot debate. One of the first things to identify, is what we mean by "quality diesel" - let us not confuse poor quality with dirty, wet or adulterated fuel. It is extremely unlikely that a single drop of diesel leaving South Africa's refineries does not conform to the SANS standard for the quality of diesel. It is from this point that the problems start, with poor transport methods, poor handling, sloppy storage and corruption. A wide variety of engine problems can be traced back to contaminated diesel.

This Technical Bulletin will look at the tests to determine diesel quality that are carried out in WearCheck's Specialty Laboratory, the instrumentation used and what the consequences of failing to meet the standard might be, along with the actual limits that are applied.

FLASHPOINT

The flashpoint temperature of diesel is the minimum temperature at which the fuel will ignite on the application of an ignition source (naked flame). Flashpoint varies inversely with the fuel's volatility. The SANS requirement is a minimum flashpoint of 55°C.

The flashpoint of the fuel does not directly affect the combustion characteristics of the engine, but is important in terms of safe storage and handling - the lower the flashpoint, the more flammable the fuel is. A low flashpoint can help identify petrol adulteration, because for every ½ percent addition of petrol, we would see an approximate 8°C drop in the flashpoint. Other contaminants - such as paraffin, other fuels and solvents - will also lower the flashpoint. Contamination with heavier fuels and lubricants will raise the flashpoint.

VISCOSITY
Viscosity is a measure of a fluid's resistance to flow. It therefore affects injector lubrication and fuel atomisation. Fuels with low viscosity may not provide sufficient lubrication for the precision fit of fuel injection pumps or injector plungers, resulting in increased wear or leakage. High viscosity fuels, on the other hand, will increase gear train, cam and follower wear on the fuel pump assembly due to the higher injection pressures.

Diesel fuels with high viscosity also tend to form larger droplets on injection, causing poor combustion and increased smoke and emissions. Fuels that do not meet viscosity requirements lead to loss of performance. Again, this test would help identify both thin (petrol)and thick (oil) adulterants. The SANS requirement is 2.0 - 5.3 centistokes.

Viscosity is measured by the length of time it takes for the diesel to flow through a calibrated tube under the force of gravity at 40°C.

DENSITY
This is a measure of the specific gravity of the fuel, in other words, how much does a litre of fuel weigh? Both volume and mass are measured to determine density. Density essentially determines the energy content of the fuel. The denser the fuel, the more power the engine can generate, and vice versa. Diesel is specified at a minimum of 0.800kg/l at 20°C (the density at 15°C is also determined). This helps to identify adulterants such as IP, which has a density of 0.790kg/l. or oil, which has an approximate density of 0.885 kg/l. Low density fuel leads to a loss of power per litre of fuel and an increase in fuel consumption. Density and viscosity are actually measured on the same instrument.

SULPHUR
This measurement helps identify what a diesel sample is not rather than what it is. Low sulphur diesel is specified at 0.005% (50ppm) or less, while normal diesel is 0.05% (500ppm). This specification only determines the maximum allowable level of sulphur in diesel - it does not mean that 50 ppm diesel has exactly 50 ppm sulphur and the same would apply to 500 ppm diesel. Contamination of 500 ppm diesel with 50 ppm diesel results in the actual sulphur content varying between 50 and 500 ppm in practice. Concentrations of less than 50 ppm are also frequently noted. In the SANS 342 document, these two fuel grades fall under what is called CF1 (clean fuels). If you read the document, you will note that there is also a CF2 requirement, which covers ultra-low sulphur fuel at 10 ppm. Although this forms part of the specification, CF2 is yet to be legislated. Legislation had been planned for September 2023, but has now been postponed to July 2026. The main reason for this is that the modification to refineries to produce 10 ppm fuel is prohibitively expensive.

Sulphur is a naturally occurring constituent of crude oil, but its presence in diesel is an area of concern. The sulphur content of diesel can either be reduced by using low sulphur crudes or during the refining process, which is expensive. There is a range of valid reasons for the removal of sulphur from our diesel supplies.

The first and most pressing reason is that high-sulphur diesels are known to influence the emission of fine particulate matter through the formation of sulphates. These particulates are considered a health hazard, and their reduction is desirable. However, the presence of sulphur must not be confused with dirty diesel; it is a vital component of diesel in that it imparts a natural lubricity, protecting fuel pumps and injectors. When this is removed during refining, it has to be replaced with additives to perform the same function.

High-sulphur fuel also produces sulphur oxides on combustion which, when dissolved in other by-products of combustion such as water, form strong acids. When these acids condense, they attack the metal surfaces of valve guides, cylinder liners and bearings. The acids produced are neutralised by the engine lubricant and, in doing so, reduce the working life of the lubricant, necessitating shorter drain intervals.

Finally, high-sulphur fuels act as poisons to catalytic converters and other systems which are used in diesel engines to reduce exhaust emissions and reduce pollution.

Sulphur is measured by X-ray fluorescence spectroscopy. It is important to use such an instrument, as other instruments and spectroscopic techniques such as ICP are not valid test methods for the measurement of sulphur in diesel.

Sulphur can be measured in either ppm or percentage; 1% is equivalent to 10 000 ppm (think of percentage as a part per hundred).

DISTILLATION
This test measures the temperature range over which a fuel turns to vapour. Volatility is one of the primary methods which distinguishes various fuels from one another. It is also an indication of the fuel's ability to start the engine, its power, fuel economy, emissions and deposit formation. In the laboratory, the point at which the diesel starts to boil is measured (IBP), the temperature at which the first 10% by volume has distilled over (T10), 20% has distilled over (T20) and so on up to 100% (T100) or the final boiling point FBP. Distillation is specified at a maximum of 362°C for T90 or 90% recovery, in other words, 90% of the fuel has boiled off. If the percentage distilled is plotted against the temperature, a characteristic distillation curve is produced. Any deviations suggest contamination.

WATER
Water causes corrosion and reduces the ability of the diesel to act as a lubricant. Very small amounts of water can actually dissolve in diesel, and the maximum allowable amount of water is 350 ppm. It is important to note that water can exist in fuel in two forms - dissolved and free. The dissolved water is measured with a Karl Fischer titrator, which is an automated, electrochemical method for determining the amount of water very accurately.

Free water is assessed by examining a beaker of the fuel on a special light tray that shows up free water droplets very easily. The presence of free water is also grounds for the diesel to fail SANS 342. Note that it is quite possible for the fuel under test to pass one test whilst failing the other. The presence of free water, whilst passing the dissolved water specification, is usually an indication of contamination whilst taking the sample.

TOTAL CONTAMINATION
This test is used to determine the amount of 'dirt' or particulate matter in the diesel. The maximum amount of particulate matter allowed in diesel is 24 mg of dirt per kg of fuel. Testing involves filtering one litre of sample through a pre-weighed 0.7 micron filter. The filter is then dried in an oven to constant weight. The difference in weight before and after is a measurement of the amount of solid particulate contamination in the sample. This test is known as IP440. The IP does not stand for 'illuminating paraffin' as many people think; in this case, IP stands for Institute of Petroleum, test method 440.

The presence of particulate matter in diesel is a source of abrasive material that can cause wear

and damage to the components in the fuel system, such as pumps and injectors. This is the only approved method for Total Contamination.

CETANE NUMBER (INDEX)
The cetane number is a measure of the ignition quality of the diesel. It represents the time delay between injection and ignition. If the cetane number is too high, the fuel will ignite too close to the injector. This forms a fuel-rich region whilst the rest of the chamber has a weak fuel-to-air ratio. Incomplete combustion and soot formation will be the result. Low-cetane fuels cause knock, difficult starting, rougher running and increased exhaust emissions. For typical on- and off-highway engines, a cetane number of 45-50 is considered ideal and is specified at a minimum of 45 in SANS 342 (but is generally found to be around 48). Illuminating paraffin has a cetane index of around 40, and will therefore affect the cetane number and performance of the diesel. The cetane number can be determined by expensive testing in an engine laboratory. However, WearCheck has a more cost-efficient test method - we determine the cetane index of the fuel using an ASTM method utilising the distillation values T10, T50, T90 and the density of the fuel at 15°C and 20°C.

VISUAL ASSESSMENT OF THE FUEL
This involves placing a beaker of fuel on a light tray and making a visual observation. The fuel is checked for free water (as discussed under water analysis), free particulate matter (visible to the naked eye) and the clarity of the diesel. Any free water, particulate matter or haziness would be grounds for the fuel to fail SANS 342. Note that, as with the water test, it is possible for a sample to pass either the total contamination or the visual assessment but fail the other. The colour of the diesel is also noted.

FUNGAL AND BACTERIAL TESTING
As the name suggests, a sample of diesel is tested for the presence of a range of bacteria and fungi. This is a time- consuming process and involves adding a portion of the diesel to a special testing strip containing a medium that is ideal for the growth of 'bugs'. This is then incubated for 72 hours in an oven. The growth of bugs over this period of time is rated against a chart and given a very slight, slight, moderate or heavy concentration of bacteria and/or fungi classification. Essentially, this may allow us to identify problem areas; it would then be up to the operator to take corrective action such as dosing the bulk tanks with a biocide.

The amount of contamination is rated in cfu/ml, colony- forming units per millilitre.

Bacteria and fungi can grow in diesel, particularly if there is water contamination. The microbes live at the fuel/ water interface and can form foul-smelling mats that can clog filters and produce acids that would be damaging to fuel-system components. Note that SANS 342 does not provide a limit on this sort of contamination, as it is not part of the specification.

BIODIESEL
Biodiesel is diesel manufactured from renewable organic sources, traditionally vegetable oils (biomass) and is considered to be an alternative, environmentally friendly source of power. Biodiesel can be used as a pure source for internal combustion engines. It can also be blended with ordinary fossil fuels (diesel). SANS 342 allows a maximum biodiesel content of 5% (B5). Biodiesel content is measured using Fourier Transform Infra-red spectroscopy (FTIR).

TOTAL ACID NUMBER (TAN)
The TAN of diesel can be measured using an electrochemical titration and gives an indication of the overall acidity of the fuel, however, it does not form part of the SANS 342 specification

PARTICLE COUNTING (ISO 4406)
Particle counting by ISO 4406 can be carried out and used as another indication of fuel cleanliness. A sample of fuel is passed through a test cell and is illuminated by a laser, the various particles cast shadows on a detector and the number of particles per ml in various size ranges can be measured. The three size ranges are greater than 4, 6 and 14 microns. The total number of particles in each size range can be converted into a guide number for each size range and expressed as an ISO 4406 cleanliness rating (such as 18/16/13): the lower this is, the cleaner the fuel is.

OTHER TESTS
There are quite a few other tests that form part of the SANS 342 specification, these are not carried out by WearCheck, but can easily be outsourced. These include copper corrosion, calorific values, cold filter plugging point (CFPP), cloud point, lubricity, carbon residue, ash and oxidation stability.

The range of tests that WearCheck offers on its standard SANS 342:2016 report covers a wide range of analyses that encompass the most common and day-to-day requirements of diesel testing. The cost of doing everything that is listed in the specification would make the cost of a fuel sample prohibitively expensive, however, the other tests can be provided on request

ILLUMINATING PARAFFIN
No article on diesel testing would be complete without some discussion on the problem of diesel being contaminated with illuminating paraffin.

In response to an article that appeared in Fin 24 on June 15th 2022, Gwede Mantashe, the South African Minister of Mineral resources and Energy, warned of the use of illuminating paraffin to doctor diesel in an attempt to defraud the revenue services and increase profits. The following discussion gives a bit of background to this practice, the deleterious effects it can have, and the various methods for testing diesel for the presence of illuminating paraffin (IP).

Diesel can be subjected to a variety of chemical and physical tests in the fuels laboratory. One of the most common and important things to look for is contaminants, the most common of which are dirt and water.

Diesel can also be contaminated with other fuels and solvents, in particular illuminating paraffin, or IP, as it is known. IP is a readily available power source for domestic lighting, heating and cooking. Chemically, it is very similar to diesel, but because it is used as a domestic power source, it is not subjected to the taxes and levies that diesel is, in other words, it is cheaper than diesel.

The less-than-honest members of our society have taken to doping diesel with IP and, because it is so similar to (but not exactly the same as) diesel, a diesel engine will run quite happily on a diesel/IP mixture at less than the cost of diesel. Although the engine will run without a problem in the short term, in the long term, the IP will be quite damaging to the engine. IP has a lower viscosity and less lubricity than diesel, and will cause damage in terms of increased wear to the components of the fuel system.

Although the price difference may not be huge, if you think of the thousands of litres of diesel used every day, doping diesel with ten or twenty percent paraffin represents a large cost saving and loss of revenue for the country's revenue services (SARS).

The effects of IP contamination on diesel are that the viscosity, density and flashpoint will decrease, and the sulphur concentration will increase. Low density means you get less bang for your buck (more litres of fuel required for the same number of kilometres travelled). Low flashpoint could become a safety issue, and elevated sulphur could impact the emission controls of modern engines and increase combustion by-products being introduced into the lubricating oil. This will reduce its ability to lubricate the engine adequately, resulting in shortened drain intervals.

Interestingly enough, small amounts of IP may not affect the properties of diesel enough for it to fail the Bureau of Standards specification SANS 342, so, IP can be present, yet the fuel will still pass the specifications of SANS 342. In fact, IP is often legally added to diesel in small amounts by the refineries, as it helps prevent the diesel from waxing (freezing) during the

cold winter months inland. Doping diesel with IP, in the long term, is not a good idea and it is also illegal.

Because this type of doping represents a loss of income for SARS, they have introduced a chemical marker into illuminating paraffin sold in South Africa. The marker comes from an American company called Authentix, which specialises in brand protection and anti-counterfeiting. This marker is added to IP at a precise concentration once the product leaves the refinery.

It is possible to test for this marker. The test kit is a lateral-flow test kit, similar to those used for testing for Covid or pregnancy. The answer is just a simple yes or no, the marker either was or was not detected. The test kit is very easy to use and takes hardly any time at all. What it cannot tell you is how much IP is present. What is important to mention is that, if the IP came from a source that was not marked, for example from across our borders where markers are not used, then no marker will be detected, yet the sample could still be contaminated, but not by enough to fail the other physical tests that are carried out, for example, viscosity, density and flashpoint.

Further testing is possible, however. The diesel sample can be sent to a SARS-approved laboratory, where they use an instrument called a GC-MS (gas chromatography – mass spectroscopy) that can measure the actual amount of the marker that is in the fuel and, from that, it is possible to calculate the actual amount of IP in the fuel, as the exact concentration of marker that is added is known.

The reason for having two levels of testing is because (at the time of publishing), the lateral-flow test kit costs about R500, whilst the actual percentage test costs around R5,500 (more than ten times the lateral-flow test), and has to be outsourced.

Although it is possible to use gas chromatography to look for IP in diesel directly, because of the very similar physical and chemical characteristics of the two liquids and the large number of compounds in each, the process is slow, expensive, not particularly accurate and difficult to carry out.

At the end of the day, as with lubricating oil, keeping diesel cool, dry and clean is a policy that reaps great benefits, and rewards the user with lower operating costs.

Djibouti to construct $1bn Rocket and satellite launch site

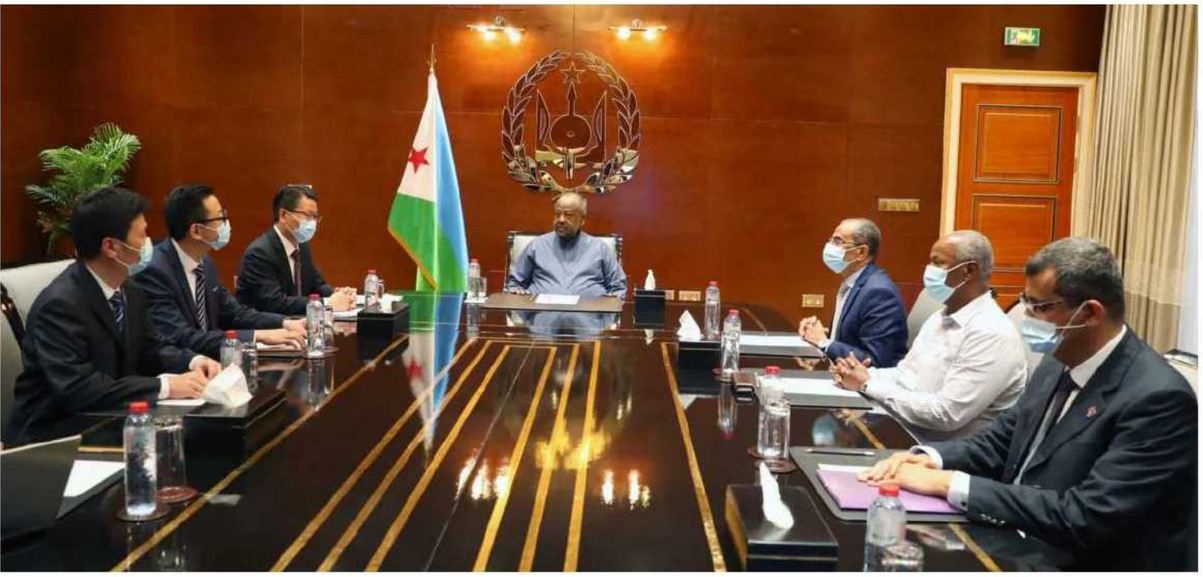
A $1 billion agreement was recently inked by Djibouti and Hong Kong Aerospace Technology to construct a rocket and satellite launch site in Djibouti. The agreement, which was reached recently and signed by the president of Djibouti, Ismail Omar Guelleh, and the Chinese company Hong Kong Aerospace Technology, will make way for the construction of the site's infrastructure.

The project will include the construction of port facilities as well as transportation corridors in Djibouti's Northern Obock. This is with an aim of facilitating the arrival of Chinese aerospace materials. President Guelleh has stated that the infrastructure could be completed as soon as 2027.

Ownership of the rocket and satellite launch site in Djibouti

Djibouti will be granted ownership of it when the 30-year co-management agreement with Hong Kong Aerospace Technology ends.

With barely over a million citizens, Djibouti is one of the smallest countries in Africa. However, due to its proximity to the equator, it is an attractive site from which to launch satellites that may benefit from Earth's rotational speed and use less fuel during ascent.



President Guelleh expressed his pleasure to see the country taking part in such a promising technological and energy development initiative.

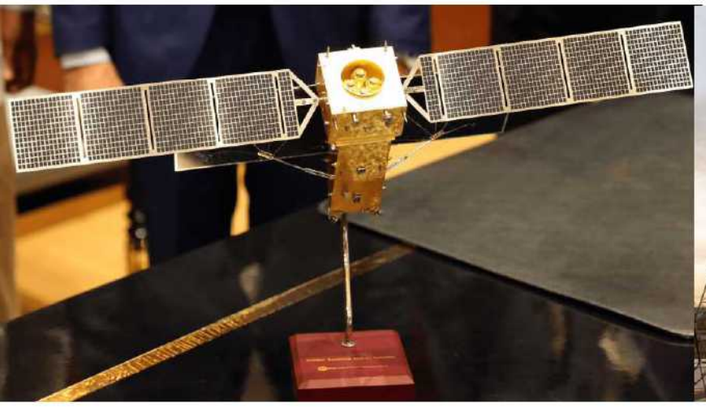
Experts claim that none of the 54 satellites launched by African countries originated in Africa. This comes after African countries expressed interest in the design as well as the construction of satellites in the past.

After the deal, Djibouti will become the latest African country with an established space program. 14 African countries have successfully launched more than 50 satellites in recent years.

Temidayo Oniosun, managing director of the consultancy Space in Africa, said that the effort will facilitate the launch of the first Africa-made satellite from the African continent.

If the project is successful, it will also have a positive impact on the industry in a number of countries and segments. The project will result in the development of new enterprises. Additionally, it will also result in spinoffs and eventually be crucial to the implementation of a continental space program.

Several African countries are currently developing their space technology. This is because they need to strengthen their economies. Most modern devices, like mobile phones and navigational systems, rely on satellites to function.



Writing Cheques only? The Role of the Owner in the Construction Project.

It was during one of those interminable construction site meetings that a comment was made that caused this writer to pause then agree. The architect and the general contractor were arguing as usual about the typical question of whether cost saving techniques proposed by the architect would actually save money or cause chaos and their dispute deteriorated into mutual recriminations then mutual protestations that each had the hardest task in the construction project and no one else on the project understood how hard their particular task was.

The Owner, who was suffering through his first real construction project broke in. "You guys have it easy. Each of you has a job that's tough. I have the job of supervising the big picture and getting the money...plus I have to handle you

guys as well."

He was right.

Risk allocation is a fundamental consideration in all contracts. Usually, parties to construction contracts will seek to include provisions that

limit and distribute their respective risks, duties, responsibilities and liabilities. Such provisions can be unreasonable in their attempts to shift responsibilities from one party to another, and should, therefore, be scrutinized very closely during contract formation and negotiation. Even where express contract provisions are provided, the law generally imposes implied warranties, duties, and responsibilities on the parties. See the other articles on this web site on Construction Law and Litigation.

The person "in charge" of the overall project is usually termed the "Owner" and is often the only nonprofessional in the entire project. It is critical for each Owner, until he or she has built numerous projects, to understand that they are operating under a significant handicap. Not only must they contend with professionals who do these types of projects (and create form contracts) for a living, but the various builders and suppliers have finite tasks while the Owner must assume financial responsibility for the success of the entire project.

Owner duties and responsibilities that have arisen in typical disputes include:
1. Providing financing for the project.

2. Providing site surveys.

3. Securing and paying for easements.

4. Warranting the plans and specifications.

5. Warranting owner furnished materials.

6. Disclosing superior knowledge.

7. Acting on clarifications and changes.

8. Interpreting the documents.

9. Cooperating with the contractor.

10. Selecting all professionals on the project.

11. Interacting with various governmental bodies.

12. Interacting with real estate professionals to sell the finished project.

13. Interacting with title companies to facilitate the sales.

Conclusion

The creation of improved property can be one of the most satisfying of all occupations. One sees land developed capable of providing homes or offices for people; one can participate in the creative process and be part of those who create beautiful things that may last for generations. Consider: when you think of great cities or civilizations, more often than not it is the buildings that seize the imagination and most buildings of most great cities were built not by the government but by private owners much like here. Paris may have beautiful public buildings but it is the private apartment houses and homes that give the city its unique charm.

But to counter that creative and often profitable advantage is the need to take risk and master a entire galaxy of skills and the above list is only the beginning. Getting experienced assistance is a must for the new developer and retaining a flexible mind, keeping alert to the innumerable problems that inevitably arise...and keeping a sense of humor are all central metal

preparation for this remarkable challenge.

But if one stares at the landscape and sees the tens of thousands of structures built in just the last twenty years it is clear that the challenge, while major, is by no means impossible and after the first project is completed one can create systems that often work on their own to control the project. As with most things, it is the first steps that are the hardest. And, as with most things, it is well worth while for many people to take up the challenge. No pain-no gain.

What Does "Workmanlike Manner" Mean? In Reference To Construction Contracts.

Almost every construction contract contains the term "workmanlike manner." If you're in the industry, I'm sure you've signed and completed numerous contracts containing that language.

But the end of the job, how do you know if the work was performed in a "good and workmanlike manner?" Read on for a discussion of this ubiquitous contract term.

Good and Workmanlike Manner Defined
The phrase refers to the acceptable standard for quality for work and materials on a construction project. Initially, courts defined it as, "the way work is customarily done by other contractors in the community." Well, what if your community does crappy work?

Many jurisdictions have moved away from the above definition. They've moved onto a new one: "that degree of efficiency and knowledge which is possessed by those of ordinary skill, competency, and standing in a particular trade or business for which the contractor is employed."

The first part of understanding a "good and workmanlike manner" is understanding that it's a bit of a moving target. The phrase itself is vague. Determining whether something has been done in a good and workmanlike manner can be incredibly subjective.

Obviously, everyone feels like they've performed a job well done. In most cases, that's true! Still, it's common for property owners to dispute payment because, as they allege, work is defective or done poorly.

Unfortunately, there's not really a cut and dry standard of what's considered workmanlike. The standard even varies state by state! Instead of worrying about what's considered "workmanlike", adopting a higher standard for quality of work might be a good idea.

That's why, as a contractor, it's crucial to understand the standard that your performance

will be evaluated against. Even if those words don't appear in your contract, every construction contract imposes on the contractor the duty to perform in a workmanlike manner.

When work is provided free from defects, done according to plan, and performed to industry-accepted standards, that work will very likely be considered done in a good and workmanlike manner.

When and Why Does Matter?
You already know the answer to this question. It's obvious. Every job must be performed up to this standard. Here's why.

It's Probably in the Contract
It's extremely common for contracts to require work be done in a good and workmanlike manner. That's true, even though no one seems to really nail down what exactly that entails.

At times, you might run across a contract that's extremely thorough and defines what that standard means, exactly, for the purposes of that job. That's great! Chances are, you're already holding yourself to that standard anyway.

Even When It's Not in the Contract...It's Still in the Contract
You read that right. The good and workmanlike manner standard doesn't even need to appear in the contract. It's actually read-into construction contracts as an implied warranty. In other words, any time a construction contract is executed, it's already legally assumed that the job must be done in a good and workmanlike manner.

What If the Work Isn't Workmanlike?
As mentioned above, even if it's not in your contract...it's in your contract. So what happens any other time when contracts are breached?

The lucky ones might have a chance to correct the work. Many states have construction defect procedures on the books, and in many cases, a contractor or sub get the opportunity to fix whatever issues are present with the work. Plus, having the work repaired or replaced will almost always be easier than starting a legal battle. Still, there's a strong chance that the customer will want to bring someone else in to do the repairs or replacement. If that's the case, they'll want to deduct any costs from what was owed for the work.

For the unlucky ones, failure to complete work in a good and workmanlike manner could get them sued for damages. Any costs caused by the flawed work could be in play. If that sounds bad, keep in mind what that might entail. Every trade is intertwined in some way or another, so it's not hard to see how one party's poor work on a project could have a dramatic ripple effect across multiple parties working on the same project. The work of multiple trades might have to be ripped out and replaced – and the party who performed shoddy work might have to foot the bill.

Conclusion
Ultimately, the biggest problem with "good and workmanlike manner" is that it's an incredibly vague standard. But being precise can help avoid workmanship disputes altogether (for the most part, at least). Whenever possible, it may be helpful to include specific expectations are instead of relying on the vague workmanlike standard.

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