



Lithium

# Smart Contract Audit Report

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# AUDITED DETAILS

## Audited Project

Project name	Token ticker	Blockchain
Lithium	LITH	Ethereum

## Addresses

Contract address	0x188E817B02e635D482AE4D81e25DdA98A97C4a42
Contract deployer address	0x4aE6B6205ddEaff7f128Ad3F395859A30a650c18

## Project Website

<http://lith.finance/>

## Codebase

<https://etherscan.io/address/0x188E817B02e635D482AE4D81e25DdA98A97C4a42#code>

# SUMMARY

Lithium Finance is the first decentralized data oracle solution that uses collective intelligence in order to regularly price liquid assets which are difficult to evaluate.

## Contract Summary

### **Documentation Quality**

Lithium provides a very good documentation with standard of solidity base code.

- The technical description is provided clearly and structured and also don't have any high risk issue.

### **Code Quality**

The Overall quality of the basecode is standard.

- Standard solidity basecode and rules are already followed by Lithium with the discovery of several low issues.

### **Test Coverage**

Test coverage of the project is 100% ( Through Codebase )

## Audit Findings Summary

- SWC-101 | It is recommended to use vetted safe math libraries for arithmetic operations consistently on lines 138, 150, 163, 164, 175, 185, 199, 216, 231, 232, 250, 267, 289, 313 and 337.
- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 9, 34, 116, 343 and 670.

## CONCLUSION

We have audited the Lithium project released on January 2023 to discover issues and identify potential security vulnerabilities in Lithium Project. This process is used to find technical issues and security loopholes which might be found in the smart contract.

The security audit report provides a satisfactory result with some low-risk issues.

The issues found in the Lithium smart contract code do not pose a considerable risk. The writing of the contract is close to the standard of writing contracts in general. The low-risk issues found are some arithmetic operation issues, and a floating pragma is set. It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

# AUDIT RESULT

Article	Category	Description	Result
Default Visibility	SWC-100 SWC-108	Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously.	PASS
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	ISSUE FOUND
Outdated Compiler Version	SWC-102	It is recommended to use a recent version of the Solidity compiler.	PASS
Floating Pragma	SWC-103	Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly.	ISSUE FOUND
Unchecked Call Return Value	SWC-104	The return value of a message call should be checked.	PASS
Unprotected Ether Withdrawal	SWC-105	Due to missing or insufficient access controls, malicious parties can withdraw from the contract.	PASS
SELFDESTRUCT Instruction	SWC-106	The contract should not be self-destructible while it has funds belonging to users.	PASS
Reentrancy	SWC-107	Check effect interaction pattern should be followed if the code performs recursive call.	PASS
Uninitialized Storage Pointer	SWC-109	Uninitialized local storage variables can point to unexpected storage locations in the contract.	PASS
Assert Violation	SWC-110 SWC-123	Properly functioning code should never reach a failing assert statement.	PASS
Deprecated Solidity Functions	SWC-111	Deprecated built-in functions should never be used.	PASS
Delegate call to Untrusted Callee	SWC-112	Delegatecalls should only be allowed to trusted addresses.	PASS

DoS (Denial of Service)	SWC-113 SWC-128	Execution of the code should never be blocked by a specific contract state unless required.	PASS
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	PASS
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	PASS
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	PASS
Signature Unique ID	SWC-117 SWC-121 SWC-122	Signed messages should always have a unique id. A transaction hash should not be used as a unique id.	PASS
Incorrect Constructor Name	SWC-118	Constructors are special functions that are called only once during the contract creation.	PASS
Shadowing State Variable	SWC-119	State variables should not be shadowed.	PASS
Weak Sources of Randomness	SWC-120	Random values should never be generated from Chain Attributes or be predictable.	PASS
Write to Arbitrary Storage Location	SWC-124	The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations.	PASS
Incorrect Inheritance Order	SWC-125	When inheriting multiple contracts, especially if they have identical functions, a developer should carefully specify inheritance in the correct order. The rule of thumb is to inherit contracts from more /general/ to more /specific/.	PASS
Insufficient Gas Griefing	SWC-126	Insufficient gas griefing attacks can be performed on contracts which accept data and use it in a sub-call on another contract.	PASS
Arbitrary Jump Function	SWC-127	As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.	PASS

Typographical Error	SWC-129	A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable.	PASS
Override control character	SWC-130	Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract.	PASS
Unused variables	SWC-131 SWC-135	Unused variables are allowed in Solidity and they do not pose a direct security issue.	PASS
Unexpected Ether balance	SWC-132	Contracts can behave erroneously when they strictly assume a specific Ether balance.	PASS
Hash Collisions Variable	SWC-133	Using <code>abi.encodePacked()</code> with multiple variable length arguments can, in certain situations, lead to a hash collision.	PASS
Hardcoded gas amount	SWC-134	The <code>transfer()</code> and <code>send()</code> functions forward a fixed amount of 2300 gas.	PASS
Unencrypted Private Data	SWC-136	It is a common misconception that private type variables cannot be read.	PASS



# SMART CONTRACT ANALYSIS

Started	Tuesday Jun 21 2022 11:09:29 GMT+0000 (Coordinated Universal Time)
Finished	Wednesday Jun 22 2022 05:16:33 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	LithiumToken.sol

## Detected Issues

ID	Title	Severity	Status
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "%" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "%" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged



# SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 138

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
137 function tryAdd(uint256 a, uint256 b) internal pure returns (bool, uint256) {
138     uint256 c = a + b;
139     if (c < a) return (false, 0);
140     return (true, c);
141 }
142
```

# SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 150

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
149   if (b > a) return (false, 0);
150   return (true, a - b);
151   }
152
153   /**
154
```

## SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

LINE 163

### low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

### Source File

- LithiumToken.sol

### Locations

```
162   if (a == 0) return (true, 0);
163   uint256 c = a * b;
164   if (c / a != b) return (false, 0);
165   return (true, c);
166   }
167
```

# SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 164

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
163     uint256 c = a * b;
164     if (c / a != b) return (false, 0);
165     return (true, c);
166 }
167
168
```

# SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 175

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
174   if (b == 0) return (false, 0);
175   return (true, a / b);
176   }
177
178   /**
179
```

## SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 185

### low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

### Source File

- LithiumToken.sol

### Locations

```
184   if (b == 0) return (false, 0);
185   return (true, a % b);
186   }
187
188   /**
189
```



# SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 199

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
198     function add(uint256 a, uint256 b) internal pure returns (uint256) {
199         uint256 c = a + b;
200         require(c >= a, "SafeMath: addition overflow");
201         return c;
202     }
203
```

# SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 216

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
215     require(b <= a, "SafeMath: subtraction overflow");
216     return a - b;
217 }
218
219 /**
220
```

# SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

LINE 231

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
230   if (a == 0) return 0;
231   uint256 c = a * b;
232   require(c / a == b, "SafeMath: multiplication overflow");
233   return c;
234   }
235
```

# SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 232

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
231  uint256 c = a * b;
232  require(c / a == b, "SafeMath: multiplication overflow");
233  return c;
234  }
235
236
```

# SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 250

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
249     require(b > 0, "SafeMath: division by zero");
250     return a / b;
251 }
252
253 /**
254
```

# SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 267

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
266     require(b > 0, "SafeMath: modulo by zero");
267     return a % b;
268 }
269
270 /**
271
```

# SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 289

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
288     require(b <= a, errorMessage);
289     return a - b;
290 }
291
292 /**
293
```

## SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 313

### low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

### Source File

- LithiumToken.sol

### Locations

```
312     require(b > 0, errorMessage);
313     return a / b;
314 }
315
316 /**
317
```



# SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 337

## low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

## Source File

- LithiumToken.sol

## Locations

```
336     require(b > 0, errorMessage);
337     return a % b;
338   }
339 }
340
341
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 9

### low SEVERITY

The current pragma Solidity directive is ""`>=0.6.0<0.8.0`"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- LithiumToken.sol

### Locations

```
8
9  pragma solidity >=0.6.0 <0.8.0;
10
11  /*
12   * @dev Provides information about the current execution context, including the
13
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 34

### low SEVERITY

The current pragma Solidity directive is ""`>=0.6.0<0.8.0`"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- LithiumToken.sol

### Locations

```
33
34  pragma solidity >=0.6.0 <0.8.0;
35
36  /**
37   * @dev Interface of the ERC20 standard as defined in the EIP.
38
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 116

### low SEVERITY

The current pragma Solidity directive is ""`>=0.6.0<0.8.0`"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- LithiumToken.sol

### Locations

```
115
116  pragma solidity >=0.6.0 <0.8.0;
117
118  /**
119   * @dev Wrappers over Solidity's arithmetic operations with added overflow
120
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 343

### low SEVERITY

The current pragma Solidity directive is "">=0.6.0<0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- LithiumToken.sol

### Locations

```
342
343  pragma solidity >=0.6.0 <0.8.0;
344
345  /**
346   * @dev Implementation of the {IERC20} interface.
347
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 670

### low SEVERITY

The current pragma Solidity directive is ""^0.7.6"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- LithiumToken.sol

### Locations

```
669
670  pragma solidity ^0.7.6;
671
672  /**
673   * @title LithiumToken
674
```

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